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Conducted by
CHARLES S. SARGENT

Director of the Arnold Arboretum, Professor of Arboriculture in Harvard College, etc.

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INDEX TO VOLUME VIII.

The asterisk (*) denotes that the subject is illustrated.

- Abelia floribunda..... 273
- Abies Cilicica..... 295
- Abutilon, Souvenir de Bonn..... 387
- Acacia pubescens..... 25
- Acacias..... 499
- Acanthophorus crinita..... 487
- Acanthus longifolius..... 278
- Accumulation in the garden..... 28
- Acer cissifolium..... 447
- insigne..... 220
- Negundo..... 502
- Pennsylvanicum..... 396
- Achilleas..... 396
- Achimenes..... 16
- Acidanthera bicolor..... 220
- Aconites..... 366
- Aconitum Fisherii..... 466
- Acorns, germination of..... 6, 105
- Acroclinium roseum..... 255
- Adenocalymna comosum..... 179
- Adiantums..... 456
- Adlumia cirrhosa..... 117
- Adonis vernalis..... 179, 197
- Adulteration of canned vegetables and fruits..... 68
- Æschynanthus Hildebrandii..... 304
- Agave Huachucensis..... 184*
- Utahensis..... 384*
- Agaves in Southern California..... 228
- Aglaoisma commutatum..... 428
- pictum..... 416
- Agricultural experiment stations..... 401
- Agriculture, coöperative..... 451
- elements of..... 500
- the year-book of the department of..... 421
- Agropyrum repens..... 103
- vulgare..... 103
- Ailanthus..... 503
- in the west..... 122
- Air drainage..... 306, 378
- Akebia quinata..... 205
- Alberta magna..... 113
- Albizia occidentalis..... 479
- Aletris farinosa..... 283
- Allamanda Hendersonii..... 337
- Allen, C. L., articles by..... 438, 458
- Alnus rugosa..... 493
- Alocasia Johnstonii..... 426
- Alströmeria aurantiaca..... 288
- Alströmerias..... 317
- Althaea officinalis..... 403
- Alvord, William, article by..... 38
- Alyssum saxatile..... 214
- sweet..... 106
- Amaryllis, cultivation of..... 56, 86
- Ammophilà arundinacea..... 412
- Anæctochilus Sanderianus..... 454
- Ananassa sativa variegata..... 355
- André, Edouard F., sketch of..... 310
- Androgynous flower-clusters..... 222*
- Andromeda Mariana..... 154
- speciosa..... 185
- Anemone blanda..... 164
- Scythinica..... 183
- Japonica..... 136, 170, 229, 288, 487
- Lady Arildiana..... 85
- nemorosa Robinsonia..... 216
- sylvestris..... 216
- Angraecum sesquipedale..... 86
- Annuals for the garden..... 97, 106, 117, 255, 256
- Antirrhinum majus, a variety of..... 120
- Aphelandra orientalis punctata..... 514
- Apple crop, western..... 478
- orchards of western New York..... 248
- unproductive..... 48
- Red Beitingheimer..... 390, 428
- Canada or Old None-such..... 10
- scab in Nebraska..... 28
- Scott's Winter..... 200
- the Hibernal..... 349
- the Senator..... 520
- Apples, best English..... 474
- color bands on..... 439
- frost injuries to..... 417
- good varieties..... 428
- marketing..... 132

Apricots in western New York..... 69

- Russian..... 368
- Aquatics, wintering..... 436
- Aquilegia Canadensis..... 207, 256
- cœrulea..... 228
- Aquilegias, hybrid..... 256
- Arabis albida..... 198
- Aralia Veitchii..... 457
- Araucaria Bidwillii..... 386
- Cunninghamii..... 410
- Araucarias in California..... 140
- Arbutus Unedo..... 498
- Arethusa bulbosa..... 422
- Arisæmas..... 73
- Aristolochia clypeata..... 444
- elegans..... 355
- Aristolochias..... 418
- Arnebia cornuta..... 305
- Arnold Arboretum, additions to..... 292
- birds of the..... 292
- Art, municipal..... 501
- Arthropodium cirratum..... 215
- Artichoke, Laon..... 500
- Arundina Philippii..... 504
- Arundinaria macrosperma..... 23
- Asarum maximum..... 133
- Asclepias obtusifolia..... 263
- tuberosa..... 290
- Ash, Green, in the west..... 32, 173
- the Sweet Mountain..... 163
- Asimina triloba..... 75, 494*
- Asparagus retrofractus arboreus..... 114
- Sprengelii..... 378
- Asperula orientalis..... 256
- undulatus..... 450
- Aster Tartaricus..... 250
- Asters..... 376, 396
- Astilbe Japonica compacta..... 157
- floribunda..... 157
- Lemonei..... 410
- Astragalus crassicaulis..... 223
- Atkinson, C. L., death of..... 480
- Atriplex hastata..... 213
- semibaccatum..... 209
- Aucuba Japonica..... 359
- Auriculas in England..... 204
- Autumn garden flowers..... 397
- in the garden..... 391
- Ayres, H. B., article by..... 128
- Azalea amœna..... 264
- Indica..... 140
- Ledifolia..... 264
- Azaleas at Brookline..... 237
- flowering for Easter..... 136
- Indian..... 177, 457

B

- Bactris major..... 466
 - Baden-Baden, notes from..... 188, 477
 - Bailey, Prof. L. H., articles by..... 34, 230, 248, 318, 418, 457, 487
 - Baillon, Henri, death of..... 340
 - Baines, Thomas, death of..... 124
 - Bamboos, cultivation of..... 4, 357
 - Banana, Ram Kela..... 454
 - Barker, M., articles by..... 36, 64, 266
 - Barron, A. F., sketch of..... 455
 - Barron, Leonard, article by..... 109
 - Basswood for western planting..... 122
 - Bauhinia Galpinii..... 444
 - Bause, C. F., death of..... 120
 - Baxter, Sylvester, article by..... 2
 - Beach-grass planting..... 412
 - Beach, Prof. S. A., articles by..... 128, 428
 - Beal, Prof. W. J., articles by..... 148, 303, 322
 - Beans, cultivation of..... 336
 - dwarf Lima..... 210
 - forcing..... 64
 - Bebb, Prof. M. S., articles by..... 363, 372, 423, 473, 482
 - death of..... 510
 - Beckwith, Prof. M. H., article by..... 57
 - Bedding plants..... 108
 - plants for..... 188, 348
 - Beech-tree in South Hingham, Massachusetts..... 121*
 - Beetles, black blister..... 508
 - Begonia acuminata..... 505
 - B. François Gaulin..... 96
 - carminata..... 304
 - Begonia Evansiana..... 435
 - Feasti..... 134
 - Froebelli..... 504
 - Gloire de Sceaux..... 133
 - Mrs. I. Heal..... 483
 - Paul Bruant..... 133
 - President Carnot..... 96
 - Rajah..... 14
 - Rex X Socotrina..... 14
 - Saundersii..... 496
 - Socotrina..... 13
 - Vernon..... 348
 - Begonias..... 508
 - bedding..... 198, 403
 - disease of..... 474
 - in flower for Easter..... 136
 - winter-flowering..... 67
 - Benson, John, article by..... 458
 - Berberis heteropoda..... 454*
 - Sieboldii..... 475
 - Thunbergii..... 492
 - Bertolonias..... 486
 - Beschornieria yuccoides..... 254
 - Bessera elegans..... 107
 - Bessey, Prof. Charles E., article by..... 102
 - Betula, hybrid..... 355*
 - lenta, oil of..... 303
 - pumila X lenta..... 243*
 - papyrifera..... 222
 - Betulas, American..... 355*
 - Bevier, Louis, article by..... 508
 - Bignonia venusta..... 114
 - Billbergia Libontana..... 384
 - rhodo-cyannea..... 376
 - Bioletti, F. T., article by..... 499
 - Birch, oil of..... 303
 - Birches, hybrid..... 243*
 - the American white..... 355*
 - Birds against injurious insects..... 350
 - of the Arnold Arboretum..... 292
 - destruction of fruit by..... 388
 - scarcity of..... 189
 - Blackberries, cultivation of..... 310, 439
 - hardy..... 50
 - profits from..... 59
 - winter protection of..... 420
 - Blood-root..... 214*
 - Blueberries..... 193
 - Boltonia latiflora..... 153
 - Bomarea Carderi..... 396
 - Bomarea Carderi..... 96
- Books Reviewed:
- Agricultural Calendar for 1896. F. W. Woll..... 479
 - American Chrysanthemum Manual, the. Michael Barker..... 399
 - American Woods. Romette B. Hough..... 499
 - Among the Northern Hills. William C. Prime..... 239
 - Annual Report of the Director of the Experimental Farms of Canada for 1894..... 519
 - Blackberries. Bulletin 99 of Cornell Experiment Station..... 439
 - Book of the Rose, the. A. Foster-Mellar..... 39
 - Barron Park Guide. Sylvester Baxter..... 330
 - China Aster. Bulletin 90. Cornell Experiment Station..... 219
 - Chrysanthemums and their Culture. Edwin Molyneux..... 399
 - Contributions of the United States National Herbarium. J. N. Rose..... 189
 - Country Month by Month, the Spring. J. A. Owen and C. S. Boulger..... 9
 - Dictionary of Orchid Hybrids. E. Bohnhof..... 209
 - English Flower Garden. the. W. Robinson..... 409
 - Familial Flowers in Field and Garden. F. Schuyler Mathews..... 219
 - Fleurs de Pleine Terre, les. Vilmarin-Andrieu & Co. 189
 - Flora of the Assyrian Monuments and its Outcomes, the. E. Bonavia..... 338
- Florida Sketch Book, the. Bradford Torrey..... 119
- Flowering Plants and Ferns of New South Wales, with special reference to their economic value. J. H. Maiden..... 299
- Forest Flora of Japan, the. Chas. Sprague Sargent..... 99
- Forest Tree-planter's Manual. J. C. Barrett..... 29
- Game Birds at Home. Theodore S. Van Dyke..... 419
- Hand-book of West-American Cone-bearers. J. G. Lemmon..... 379
- Horticulturist's Rule Book, the. L. H. Bailey..... 269
- How to Know the Wild Flowers. Mrs. William Starr Dana..... 219
- In a Gloucestershire Garden. Henry N. Ellacombe..... 329
- Irrigation Farming. Lute Wilcox..... 389
- Land Birds and Game Birds of New England. H. D. Minot. Edited by William Brewster..... 169
- Les Orchidées Exotiques et leur Culture en Europe. Lucien Linden. A. Coañaux and G. Grignan..... 190
- Lindenia. Lucien Linden..... 49
- List of the Pteridophyta and Spermatophyta growing without cultivation in north-eastern North America. Prepared by the Committee of the American Association for the Advancement of Science, from the Memoirs of the Torrey Botanical Club, Vol. V..... 179
- Maladies des Plantes Agricoles, Vol. I. Ed. Prillieux..... 509
- Manual of Forestry, a. W. Schlich..... 309, 319
- Medical Plants of Tennessee, the. A. Gattinger..... 29
- Our Edible Toadstools and Mushrooms and How to Distinguish Them. W. Hamilton Gibson..... 488
- Popular Treatise on the Physiology of Plants, a. Dr. Paul Sorauer. Translated by F. E. Weiss..... 149
- Practical Flora for Schools and Colleges, a. Oliver R. Willis..... 69
- Silva of North America, the. Charles Sprague Sargent..... 119
- Soil, the: Its Nature, Relations and Fundamental Principles of Management. F. H. King..... 509
- Story of the Plants, the. Grant Allen..... 359
- Sweet-scented Flowers and Fragrant Leaves. Donald McDonald..... 129
- Synoptical Flora of North America. Asa Gray and Sereno Watson; continued and edited by Benjamin Lincoln Robinson..... 429
- Ten New England Blossoms, and their Insect Visitors. Clarence Moores Weed..... 289
- Through Glade and Meadow. Joseph Jackson..... 9
- Timber-trees, Native and Foreign. Thomas Laslett..... 19
- Wayside and Woodland Blossoms. Edward Step..... 349
- Wild Garden, the. W. Robinson..... 109
- Woman's Book, the..... 29
- Wonderful Wapentake, the. J. S. Fletcher..... 279
- Bordeaux mixture, age of..... 378
- — and color tests..... 128
- — the preparation of..... 159
- Rowers in Hickory-trees..... 352*
- Boronia heterophylla..... 149
- megastigma..... 75, 104
- Boston, Chrysanthemums in..... 459
- rose and strawberry show..... 259
- spring flower show..... 139
- Botanic garden at Agricultural College, Michigan..... 303, 322
- — — notes from the Harvard..... 516

Index.

Botanical Garden, Missouri, notes from the..... 497

— the New York..... 261

Bougainvillea glabra..... 18

— splendens..... 326

Boursault, Jean François..... 32

Bouvardias for garden planting..... 116

Bowling Green, the proposed statue in..... 251

Box Elder trees in the west..... 173, 502

Brachycome iberidifolia..... 314

Brandegee, T. S., article by..... 134

Brandis, Sir Dietrich, article by..... 499

Bravoa geminiflora..... 306

Bridge, an old, in Wrentham, Massachusetts..... 42*

Britton, Prof. W. E., articles by..... 443, 497

Brodiaea uniflora..... 44

Bromus secalinus..... 103

Brookline, Massachusetts, notes from..... 498

Broom-handles, consumption of wood for..... 170

Browallia speciosa major..... 358

Brown, Robert, death of..... 500

Brunfelsia eximia..... 77

— latifolia..... 27, 155

Buchanan, James, and plant variation..... 442

Bulbocodium vernum..... 158

Bulbophyllum grandiflorum..... 153

Bulbous plants..... 386

Bulbs for spring planting..... 106

— greenhouse, for early spring flowering..... 167

— spring-flowering..... 176, 497

Bull, Dr. Ephraim W., death of..... 400

Burbank, Luther, article by..... 349

Burill, Prof. T. J., article by..... 368

Bush, E. F., articles by..... 32, 379, 463

Butternuts, the cultivation of..... 20

Butz, Prof. George C., article by..... 448

C

Cabbage maggot, the remedy for..... 520

Cabbages, disease of..... 284

Cabomba aquatica..... 334

Cacti, repotting..... 80

Cactus society, a national, in England..... 284

— versus Mammillaria..... 113

Caladium argyrites..... 368

Caladiums, fancy..... 297

— for outdoor use..... 156

Calanthe, Baron Schroeder..... 94

Calceolaria Burbridgei..... 14

Calendula officinalis..... 106

California brook-side, a..... 142*

— experiment stations..... 62

forests, observations in..... 402

fruits..... 512

Japanese vegetation in..... 302

Orange groves..... 78

southern, garden notes from..... 428

spring in..... 108

Calla, Snowflake..... 50

Callas..... 296

— abnormal growth of..... 316

Callicarpa purpurea..... 396

Callirhoe involucrata..... 366, 396

Callistemon speciosus..... 157

Calochorti in gardens..... 357

Calochortus Benthami..... 169

Calopogon pulchellus..... 283, 422

Camellia theifera, cultivation of..... 24

Cameron, Robert, articles by..... 77, 86,

117, 197, 216, 228, 255, 267, 277, 287, 307,

310, 366, 404, 508, 516

Camoënsia maxima..... 40

Campanula Carpathica..... 256

— latifolia..... 297

— macrantha..... 267

— persicifolia..... 267, 297

— alba grandiflora..... 228

Portenschlagiana..... 267

pumila Maresii..... 207

Vidalii..... 323

Campanulas, some garden..... 308, 313, 316,

406

Candytufts, hardy..... 106

Canna, Columbiæ..... 210

— John White..... 505

Cannas..... 307, 348, 367, 398, 400, 407, 417

— for Easter..... 136

— in England..... 374

— the best new..... 116, 520

Cantaloup, the winter..... 457

— what is a..... 183

Caragana arborescens..... 214

Card, Fred W., articles by..... 7, 28, 223,

242, 348, 388, 468

Caricas in California..... 388

Carnation, Ada Byron..... 178, 476

— Alaska..... 99, 108, 178, 476

— Anna Webb..... 108

— Annie Lonsdale..... 459

— Bride of Erclesort..... 178

Bridesmaid..... 469, 476

Bouton d'Or..... 108

Buttercup..... 99, 108

Crystal..... 476

Daybreak..... 99, 476

Dean Hole..... 99

Della Fox..... 99

- Carnation, Eldorado..... 108
 — Fred Creighton..... 178
 — Fred, Weir..... 460
 — Hector..... 108, 178
 — Helen Keller..... 99, 108, 178, 476
 — Henrietta Sargent..... 99, 108
 — Isabella Hunnewell..... 108
 — Jacqueminot..... 99, 108
 — Jubilee..... 99
 — Lena Salina..... 99, 108
 — Lily Dean..... 108, 178
 — Lizzie McGowan..... 108, 178
 — Maud Dean..... 99, 108
 — Meteor..... 99, 176
 — Minnie Cook..... 108, 178
 — Mrs. Fisher..... 108, 178
 — Nicholson..... 108
 — Nobscot..... 108
 — Portia..... 108
 — Rose Queen..... 108
 — Silver Spray..... 108
 — Storm King..... 99, 108, 178
 — Stuart..... 108
 — Thomas Cartledge..... 108
 — Tidal Wave..... 99
 — Triumph..... 108
 — William Scott..... 99, 178
 — Winter Cheer..... 108
 — cuttings..... 506
 — Society, the American, meeting of..... 89, 99, 108
 Carnations, aerial roots of..... 158*
 — cultivation of..... 26, 110, 178, 277,
 357, 427, 476
 — in Flatbush..... 37
 Carpinus cordata..... 295
 Carrot, the wild..... 420
 Cary, Austin, article by..... 88
 Caryocar nuciferum, fruits of..... 509
 Caryopteris mastacanthus..... 397, 407,
 430, 457
 Cassandra..... 493
 Castanopsis chrysophylla, tanning properties of..... 293
 Castor-beans, cultivation of..... 220
 Catalpa speciosa..... 502
 Catananches..... 367
 Catasetum Bungerothii..... 374
 — imperialis..... 503
 Catasetums, new..... 123
 Cat-tails, how to exterminate..... 428
 Catleya Eros..... 354
 — floribunda..... 224
 — Fowleri..... 354
 — Gigas..... 483
 — labiata..... 447, 488
 — labiata, Cooksonae..... 444
 — Mantini..... 444
 — Percivaliana..... 123
 — superba alba..... 274
 Catleyas, new hybrid..... 374
 Cauliflower for winter..... 348
 Cedar of Algeria, the..... 333*
 — the Red..... 61*
 Cedrela Siensis..... 380
 Cedronella cana..... 366
 Cedrus Atlantica..... 332*
 Celery, 36
 Celery, cultivation of..... 257, 336
 — greenhouse..... 266
 Celosia floribunda..... 479
 Celosias, cultivation of..... 117
 Celosia for western planting..... 122
 — occidentalis..... 346
 Cenchrus myosuroides..... 103
 — Palmeri..... 103
 — tribuloides..... 103
 Centaurea cynaroides..... 314
 — moschata..... 280
 Centranthus ruber..... 314
 Centropogon Lucyanus..... 64, 506
 Ceratostigma plumbaginoides..... 447
 Cercis Canadensis..... 184, 484
 Cercopodus parvifolius paucidentatus..... 22
 Cestrum elegans..... 74
 Chamædorea desmonoides..... 388
 — glaucifolia..... 504*
 Chamærops gracilis..... 479
 Chamberlin, John, articles by..... 209, 269
 Chelone Lyoni..... 397
 Chenopods, species of..... 193
 Cherries, classes of..... 410
 — experience with..... 58
 Cherry, Dwarf Rocky Mountain..... 468
 — fruit mold, the..... 137
 — Japanese Weeping..... 168
 — the Lutovka..... 330
 — the Sand..... 123, 468
 Chestnut in the west, the..... 83
 — weevil, the..... 8
 Chestnuts, Japanese..... 460
 Chicago, Chrysanthemums in..... 468
 Chickamauga, national park at..... 371
 Chimaphilas..... 493
 Chimonanthus fragrans..... 150, 169
 Chico Creek, Butte County, California, view on..... 142*
 China Aster..... 76, 219
 Chino Valley experiment station, the..... 212
 Chionodoxa gigantea..... 164
 — Luciliae..... 188
 Chionodoxas..... 157
 Chiricahua mountains, tree flora of..... 12,
 22
 Chitomoxas, cultivation of..... 8
- Christ, Dr. H., article by..... 238
 Chrysanthemum, Baltimore Belle..... 450
 — Challenge..... 478
 — Charles Davis..... 459
 — Constellation..... 468
 — Crystalina..... 466
 — Dr. Callendreau..... 466
 — E. G. Vihlein..... 459
 — E. Molynex..... 436
 — Enfant des Deux Mondes..... 459
 — yellow sport of..... 459
 frutescens..... 313
 Golden Wonder..... 469
 H. L. Sunderbruch..... 436, 440, 468
 Imperial Castle..... 458
 J. H. Troy..... 436, 440
 Katherine Leech..... 459
 L. Channing..... 478
 Louise D. Black..... 459, 478
 Marion Cleveland..... 450
 Mayflower..... 440, 468
 Minerava..... 459
 Miss Agnes Louise Dalkson..... 450
 Miss Georgiana Pitcher..... 466
 Miss Helyett..... 466
 Miss M. M. Johnson..... 466
 Monsieur Georges Biron..... 466
 Mrs. F. B. Hayes..... 488
 Mrs. George M. Bradt..... 469
 Mrs. Henry Robinson..... 436, 440
 466, 468
 Mrs. M. J. Parker, Jr..... 436
 Mrs. M. R. Parker, Jr..... 466
 Mrs. Perrin..... 450, 458, 460, 468
 Mrs. W. C. Egan..... 469
 Mrs. W. H. Rand..... 466
 Mrs. W. P. Raymond..... 469
 Nemesis..... 436, 440
 Niveum..... 468
 Philadelphia..... 459, 466
 Rider Haggard..... 466
 St. Clair..... 479
 Sunrise..... 436, 440, 466
 The Bard..... 468
 William Simpson..... 458, 464*
 W. W. Astor..... 466
 Yellow Queen..... 468
 Chrysanthemums, fashions in..... 517
 — in Boston..... 459
 — in Chicago..... 468
 — in London..... 473
 — in New York..... 469, 488
 — in Philadelphia..... 458
 — in Poughkeepsie..... 460
 — in St. Louis..... 478
 midsummer care of..... 287
 new and old..... 18
 — at Cornell University..... 466
 — in England..... 446, 504
 — in New York..... 450
 notes on..... 247
 — the newer..... 36
 training for..... 14
 cultivation of..... 87, 127, 377
 — early-flowering..... 86, 397, 427
 — for specimen plants..... 196
 — good varieties of..... 436
 propagation of..... 46, 67, 517
 Cicutia maculata..... 172
 Cigar-case-bearer, the, on fruit trees..... 270
 Cimicifuga racemosa..... 316, 337
 Cinchona Calisaya Ledgeriana..... 520
 Cinerarias, cultivation of..... 97
 — sowing seed of..... 276
 Cirrhopterum robustum..... 273
 — Rothschildianum..... 444
 Citrus trifoliata..... 455, 437
 Cladrasitis..... 372
 — lutea..... 237, 504
 Cleghorn, M. D., Hugh Francis Clarke, death of..... 260
 Clematis coccinea..... 315
 — indivisa..... 56, 487
 — new hybrid..... 234
 — paniculata..... 147, 397, 489
 — recta..... 25, 277
 — species of..... 337, 464
 — Virginiana..... 385
 Clerodendron A'Priori..... 234
 — fallax..... 236
 — squamatum..... 288
 Clerodendrons..... 323
 Clethra alnifolia..... 109, 340
 Chianthus Dampieri..... 238
 Climbers, greenhouse..... 216
 Climbing plants, a few..... 418
 Clivia minata..... 124
 Clover, crimson..... 59
 Cnicus horridulus..... 283
 Cobæa..... 117
 Cob-nuts, Kent..... 70
 Cochrane, George A., article by..... 132
 Cockerell, Prof. T. D. A., articles by..... 244, 499, 513
 Coe, Charles H., article by..... 432
 Ccelogyne Micholitzii..... 144
 — Veitchii..... 374
 Colchicum luteum..... 188
 — Svozitsianum..... 188
 Colchicums..... 386, 436
 Columbine leaf-miner, the..... 443*
 Collins, Dorcas E., article by..... 409
 Collomia verna..... 256
 Comandra livida..... 194
 Composites, some native..... 376

- Comstock mines, consumption of wood in the..... 38
 Conifers, distribution of, in Iowa..... 279
 — in the west..... 182
 Conium maculatum..... 172
 Conservatories, small..... 437
 Copis trifolia..... 78
 Corallorrhiza innata..... 422
 — multiflora..... 422
 Coral-tree, the..... 347
 Corbett, L. C., articles by..... 173, 378, 494
 Coreopsis..... 314
 — delphinifolia..... 435
 — grandiflora..... 24, 208, 239, 260
 Corn for fodder or for ensilage..... 160
 — Indian..... 23
 — variation in..... 378
 Cornus florida, fruit of..... 500
 Cornus Mas..... 153
 Corylus Californica..... 263, 344*
 — rostrata..... 263, 344*
 — species of..... 345
 Cosmos sulphureus..... 426, 484*
 Cottonwood-trees..... 173, 502
 Cowberry, the..... 193
 Craig, W. N., articles by..... 8, 26, 46, 86,
 98, 107, 136, 158, 178, 197, 208, 217, 226,
 257, 277, 307, 326, 336, 357, 387, 416, 448,
 476, 506
 Cratægus apiifolia..... 463
 — Carrigeria..... 495
 — fruits of..... 492
 — punctata..... 225
 Crinum augustum..... 304
 — Kircape..... 288
 — purpurascens..... 343
 — Rozoenianum..... 322
 — Schimperi..... 253
 Crinums, notes on..... 327
 Crocus biflorus..... 109
 — Imperati..... 109
 Crocuses..... 477
 Crotalaria longirostrata..... 6
 Crotons..... 348, 358
 Crow, economic status of the..... 440
 Cryptocoryne cordata..... 334
 Cucumber, "Cool and Crisp"..... 328
 Cucumis dipsaceus..... 336
 — Melo inodorus..... 457
 — species of..... 475
 Cupheas..... 397
 Cypressus Arizona..... 22
 Curculigo recurvata..... 498
 Curmeria Wallisii..... 316
 Currant, the Fay..... 200
 Cyclamen Persicum..... 177
 Cyclea Burnmanni..... 174
 Cycnoches Egertonianum..... 274
 Cymbidium eburne-Lowianum subperbum..... 94
 — Traceyanum..... 4
 Cydonia Dactylon..... 73, 103
 Cyperus alternifolius..... 217
 — rotundus..... 103
 Cypridium bellatulum album..... 273
 — Calypso Rothwellianum..... 63
 — Countess of Salisbury..... 486
 — Gertrude Hollington..... 224
 — Henry Graves..... 54
 — insigne..... 420
 — for winter culture..... 99
 Janus..... 64
 Massaiyanum superbum..... 354
 Morgania Bufordiensis..... 374
 nitens Pitcheria..... 63
 platycolor..... 504
 Rothschildianum..... 139
 Sallieri pictum..... 63
 — Roeblingi..... 56
 Stone platytænum..... 234
 Cypripediums at Brookline..... 499
 — hardy..... 216
 — hybrid..... 95
 — native..... 413
 Cyrtanthus Huttoni..... 253
 Cyrtopodium punctatum..... 167
 Cytisus Andreeanus..... 157
 — flowering for Easter..... 136
 — racemosus..... 276

D

- Daffodils, cultivation of..... 187
 — the earliest..... 166, 167
 Dahlia society, the American, meeting of..... 418
 Dahlias in England..... 374
 Daisies, Swan River..... 106
 Damping off..... 77
 Dana, Charles A., article by..... 442
 Danae racemosa..... 64
 Dandridge, Danske, articles by..... 168,
 189, 198, 249
 Daphne Cneorum..... 200
 — Indica..... 346
 Daturas..... 344
 Day, David F., article by..... 338
 Decodon verticillata..... 362
 Delphiniums..... 314
 Dendrobium, Apollo..... 144
 — bracteosum..... 354
 — Cordelia..... 153
 — cruentum..... 354
 — Hildebrandii..... 153

- Dendrobium Johnsonae..... 123
 — nobile..... 139
 — Allantani..... 150
 — nobilis..... 153
 Phalaenopsis..... 156, 343
 — hololeuca..... 354
 — sanguineum..... 414
 — speciosissimum..... 123
 — subclausum..... 504
 Wattii..... 53
 Dendrocalamus membranaceus..... 479
 Dendrolene..... 479
 Deutzia gracilis for Easter..... 136
 — Lemoinei..... 400
 — parviflora..... 164
 De Wolf, John, article by..... 342
 Dicentra spectabilis..... 397
 Dichorisandra thyrsiflora..... 456
 — undata..... 514
 Dictamnus albus..... 254
 Dierama pulcherrima..... 346
 Dionaea muscipula..... 208
 Diospyros Virginiana..... 262*
 Dipladenia Boliviensis..... 498
 Dipladenias, cultivation of..... 297
 Diplarrhena Moresa..... 104
 Dipterocephalaceæ..... 499
 Disas, hybrid..... 274
 Dock, Mira Lloyd, article by..... 78
 Doing too much..... 291, 311
 Donlan, J. I., article by..... 398
 Doronicum plantagineum..... 15
 — excelsum..... 110
 Downing, A. J., the debt of America to..... 211
 Downingia pulchella..... 256
 Downs, W., articles by..... 27, 76, 117
 Drennan, G. T., article by..... 133
 Dracena Baptista..... 498
 — Godesfiana..... 24
 — magnifica..... 498
 — Sanderiana..... 326
 Dracenas..... 418
- E**
- Easter, some flowering plants for..... 136
 Eaton, Prof. Daniel Cady, death of..... 280
 Echinacea angustifolia..... 307, 407
 — purpurea..... 327, 407
 Echinocactus Wislizeni and some related species..... 154*
 Egyptian antiquities at Giseh, collection of funeral wreaths and offerings in the museum of..... 312
 Echinops commutatus..... 297
 Elæagnus argentea..... 274
 — longipes..... 238, 437
 Electricity and plant-growth..... 60
 Eleusine *Ægyptiaca*..... 103
 — Indica..... 103, 430
 Elm-leaf beetles, fighting the..... 347
 Elm, White, in the north-west..... 53, 173
 — the Penn Treaty..... 240
 Elwes, H. J., article by..... 98
 Endicott, W. E., articles by..... 16, 176, 296, 316, 507
 Ephestia inter punctella..... 323*
 Epidendrum Stamfordianum..... 234
 Epigaea repens..... 15
 Escipia densa..... 454
 Eranthemums, the..... 516
 Eranthus hyemalis..... 124
 Eremurus in gardens..... 127, 265
 Erica pygmæa..... 229
 Ericas..... 499
 — hardy..... 366
 Erigeron Canadense, a form of..... 213
 Erodiums, species of..... 193
 Eryngium Virginianum..... 303
 Eryngiums..... 314
 Erythrea armata..... 388
 Erythrinæ, the..... 347
 Erythroniums..... 176
 Eucharis Amazonica..... 86
 — Lowii..... 253
 — Stevensi..... 133
 Eupholiella Elizabethæ..... 123
 Eupatorium purpureum..... 350
 Euphorbia corollata..... 326
 — fuliginea..... 17, 276
 — hæmatodes..... 358
 — jacquinæ-flora..... 17
 — pulcherrima..... 486
 Euphrasia officinalis..... 213
 Euryale ferox..... 337
 Erycites sylvestris..... 253
 Evergreens, tender, winter storage for..... 208
 Evonymus alatus..... 426
 Exochorda grandiflora..... 205
 Experimental farm in North Carolina..... 299
 Experiment stations, bulletins of the agricultural..... 429
 — agricultural..... 401
- F**
- Fagus sylvatica..... 474
 Farm home reading circle, the..... 131
 Faunce, M. D., R. H., article by..... 249
 Faxon, C. E., articles by..... 52, 292
- Fernal, Merritt Lyndon, article by..... 28
 Fernow, B. E., articles by..... 242, 467, 472
 Ferns, cultivated, in Kew Gardens..... 224
 — for decorative use..... 456
 — from spores..... 50
 Ferrocyanide potassium test..... 336
 Fertilizers, home-mixed..... 58
 Ficus elasticæ propagating..... 7
 Fig-trees, in North Carolina..... 386
 Figs in Buffalo, New York..... 269
 Flora of a Long Island swamp..... 282
 Florida, effects of cold in..... 20, 30, 40, 70, 130
- Flower Company, the New York Cut..... 452, 462
 — garden notes..... 127, 166, 197, 387
 — markets of New York City, the wholesale..... 232
 — show, spring, in Boston..... 139
 Flowers, annual, novelties in..... 70
 — at Christmas..... 10
 — cut, for summer..... 116
 — doubling of..... 448
 — early..... 107, 129, 157, 178
 — for Easter..... 110
 — market, in private gardens..... 118
 — native, exhibition of..... 210
 — popular, books about..... 201
 — preservation of colors of dried..... 95, 109
 — September wild..... 408
 — some July..... 296
 — wayside..... 193
 Folsom, Justus Watson, articles by..... 383, 392
 Fontanesia Fortunei..... 44
 Forage problem in Iowa, the..... 28
 Forcing-house notes..... 407
 Forest, a northern..... 282*
 — at Baltimore, Mr. Vanderbilt's..... 481
 — fires..... 242
 — in Minnesota..... 128, 148
 — schools in America, the need of..... 298
 — trees in spring, American..... 191
 Foresters, why we need skilled..... 131
 Forestry Association, the American, meeting of..... 369
 — meeting of the American and New Jersey State Associations..... 229
 — and abandoned farms..... 162
 — at the Michigan Agricultural College..... 148
 — British..... 8
 — exhibit at Atlanta..... 449, 470
 — for farms..... 411
 — policy in Germany..... 382
 — summer school of..... 120
 Forests and rivers..... 371
 — California, destruction of..... 490
 — observations in..... 402
 — of the national domain, the, 51
 — of the Wabash Valley, the..... 101*
 — importance of, to the German people..... 180
 Fosterman, Ignatz, death of..... 150
 Fothergilla Gardeni..... 46*
 Fragaria Indica..... 193
 Franceschi, F., articles by..... 228, 388
 Fraxinella..... 267
 Fraxinus Pennsylvanica lanceolata..... 32
 Fritillaria alpina..... 183
 — imperialis aureo-marginata..... 208
 Fritillarias..... 216
 Frost and fruits..... 448
 Fruit, an exhibition of, in England..... 473
 — as food..... 48
 — drying, a representative rural industry..... 441
 — farm, experimental, in England..... 224
 — from English colonies..... 114
 — growing, commercial..... 48
 — in California, new fields in..... 258
 — rot..... 368
 — tree, a valuable, for the high north..... 162
 — trees, flowering..... 168
 Fruits and frosts..... 448
 — and vegetables, adulteration of canned..... 68
 — California..... 512
 — does size affect flavor and color of..... 498
 — keeping fresh..... 420
 — Russian tree, in America..... 226, 236
 Fungus on Quince-leaves..... 160
- G**
- Galanthus Caucasicus..... 188
 — Elwesiæ..... 124
 — and other species..... 144
 — new and old forms..... 137
 — Oligæ Reginæ..... 477
 Galtonia candidans..... 343
 Galtonias..... 310
 Garden, accumulation in the..... 111, 100
 — at Wellesley, the flower..... 353
 — color in the..... 321
 — flowers for cutting..... 116
 — in late summer, the..... 357
 — notes..... 507
- Garden plants, some new..... 85, 503
 — preparatory work for the..... 76
 — spring work in the..... 146
 — the flower..... 127, 166, 307
 — the rock..... 205, 249, 256, 308
 — the vegetable..... 336
 — winter, gift of..... 4
 — work for early July..... 276
 Gardening an outlet for vitality..... 42
 — unnatural..... 361
 Gardens at Ventura..... 399
 — autumn, suggestions for..... 391
 — of Mexico, floating..... 431*
 — old-fashioned..... 281
 — railway station..... 429
 — the social use of..... 342
 Gaylussacias..... 492
 Genista Andreana..... 229, 499
 Gentiana cruciata..... 297
 — pneumonanthe..... 297
 — saponaria..... 409
 — Thibetica..... 297
 Gentians..... 397
 Geonoma acaulis..... 466
 Geranium armenum..... 367
 — Mrs. Parker..... 348
 Gerard, J. N., articles by..... 18, 76, 85, 97, 106, 107, 117, 118, 137, 147, 157, 167, 169, 178, 187, 207, 216, 228, 246, 267, 286, 317, 327, 357, 368, 376, 386, 389, 408, 416, 428, 467
 Gerardias..... 363
 Gerbera Jamesoni..... 493
 Geum, species of..... 367
 Ginkgo biloba..... 456, 515
 Gladioli..... 296, 317
 — in England..... 373
 Gladiolus Brenchleyensis..... 343
 — citrinus..... 144
 — trichonemifolius..... 144
 — tristis concolor..... 74*
 Gloxinias..... 27, 177, 247, 276
 Goff, Prof. E. S., articles by..... 143, 155, 238, 292, 349
 Gold Thread, a search for..... 78
 Golden-rod killing horses..... 477
 Golden-rods, late-flowering..... 458, 499
 Goldring, W., articles by..... 364, 373, 394
 Goodrich, S. F., article by..... 299
 Goodyera pubescens..... 423
 Grammatophyllum Rumphianum..... 273
 — speciosum..... 356
 Grape, Alice..... 107
 — belt, the Chautauqua..... 438
 — Campbell's Early..... 470
 — Colerain..... 107
 — growing in North Carolina..... 337
 — the botany of..... 47
 — Golden Pocklington..... 408
 — Green Mountain..... 79, 380
 — propagation of the..... 48
 — trellis, the Munson..... 186
 Grapery, the..... 76
 Grapes, best of the year..... 377, 377
 — black-rot of..... 450
 — in north-eastern Vermont..... 96
 — keeping fresh all winter..... 458, 499
 — new..... 107
 — thinning..... 157
 — under glass..... 87, 496
 — Vergennes and Moore's Diamond..... 487
 Grapine, a large..... 139
 Grass, Beach..... 412
 — Bermuda..... 73
 — Buffalo..... 193
 Grasses at Wellesley..... 358
 — troublesome, in southern New Jersey..... 103
 Greenhouses, work in..... 417
 Grevillea Preissii..... 77
 — Thelmanniana..... 77
 Gunnera manicata..... 54*
 Gynura jubatum..... 444
 Gynura aurantiaca..... 64
 Gypsophila paniculata..... 280, 337
 Gypsy moth in Massachusetts, the..... 108
- H**
- Habenaria rhodocheila..... 274
 Habenarias..... 422
 Habrothamnus elegans..... 217
 Hæmanthus Kalbreyeri..... 253, 288
 — Katherinei..... 343
 Hale, J. H., article by..... 496
 Halsted, Prof. Byron D., articles by..... 137, 158, 172, 518
 Hardy herbaceous plants for florists' use..... 360
 — perennials..... 327, 337, 366, 396, 406
 Harris, Dr. Robert P., article by..... 457
 Harrison, W. H., article by..... 268
 Harshberger, Dr. John W., article by..... 239
 Hartman, C. V., article by..... 162
 Hatfield, T. D., articles by..... 26, 46, 66, 87, 116, 127, 136, 146, 167, 177, 196, 205, 217, 237, 247, 256, 276, 287, 308, 318, 337, 358, 367, 377, 397, 417, 427, 436, 437, 487, 498, 517
 Havard, Dr. V., article by..... 203
 Hazels, the..... 344
 Heath family in The Pines..... 492
 Heaths, hardy..... 366
- I**
- Iberis sempervirens..... 228
 Idria Columaria..... 503
 Ilex Vomitoria..... 520
 Impatiens amphorata..... 493
 — Sultani..... 106
 — violacea..... 505
 Improvement Association at Narragansett Pier..... 318
 Incarvillea Delavayi..... 234, 241, 250
 Indian Corn..... 43
 Inga pulcherrima..... 154
 Insect pests..... 187
 Insecticides tested..... 187
 Insects, injurious, destroyed by birds..... 310
 — injurious to fruits..... 71
 — scale..... 344, 513
 Inula glandulosa..... 224
 Iowa, conifers in..... 24
 Ipomoea imperialis..... 366
 — Learii..... 428
 — versicolor..... 428
 Ipomoeas..... 117, 418
 Iris Hartwegii..... 323
 — hexagona..... 329
 — Japonica..... 306
 — Kochii..... 215
 — macrantha..... 234
 — Nepalensis Letha..... 254
 — orchoides..... 170

Index.

Iris Palaeistica.....	6
— pallida Dalmatica.....	236
— Parvar.....	225
— reticulata Krelagei.....	75
— Rosenbachiana.....	146
— tubro-marginata.....	196
Sindjarenensis.....	176
vulgaris.....	266
xiphioptides.....	265
Irises, notes on.....	246
— American.....	286
— Californian.....	428
— Oncocyclus.....	416
Irrigation in Kansas.....	518, 520
— New England.....	496
— New Jersey.....	518
of orchards in New York.....	236
Isotoma longiflora.....	368
Ixias, cultivation of.....	167, 177, 597

J

Jack, J. G., articles by.....	6, 15, 45, 222, 243, 323, 344
Jackson Park, Chicago.....	300
Jacobinia magnifica.....	6
Jasminum, new species.....	153
— nudiflorum.....	118, 153
Jatropha podagrica.....	104
Johnson, J. E., article by.....	108
Juglans rupestris.....	13
Juneberries, dwarf.....	500
Juniperus pachyphyllea.....	13
— Virginiana.....	61*

K

Kale, Jersey.....	430
Kalmia cuneata.....	434*
— latifolia myrtifolia.....	315*
— transplanting.....	347
Keffer, Prof. Charles A., articles by.....	12, 32, 52, 82, 83, 112, 122, 132, 142, 152, 163, 182
Kellogg, George J., article by.....	298
Kelsey, Frederick W., article by.....	310
Kentia Belmoreana.....	488
Kentucky Coffee Tree for western planting.....	122
Kerria Japonica.....	104
Kew, picturesque scenery at.....	503
Kimball, William S., death of.....	140
Klugia Notoniana.....	4
Knight, Thomas Andrew, sketch of.....	572
Kniphofia aloides.....	435
— Natalensis.....	23, 327
— Nelsoni.....	477
— pauciflora.....	276, 327
Knot-weed, the Saghalin.....	67
Koelreuterias.....	280

L

Lactuca Canadensis.....	223
— Ludoviciana.....	223
Lælia anceps.....	517
— autumnalis.....	17, 54
— purpurata.....	54
Lælias, cultivation of.....	17
Lælio-Cattleya callistoglossa ignescens.....	483
— Ingruml.....	504

Lagerstroemia Flos Reginæ.....	479
— Indica.....	457
Lake Keuka vineyards.....	498
Lakes, disappearance of western.....	482
La Mance, Lora S., articles by.....	98, 179, 329, 389
Lamourouxia Pringlei.....	273
Landscape and utility.....	2
— art in the military parks.....	481
— gardening.....	2, 111, 199, 241, 271, 308, 361, 391
— work, overcrowding in.....	28, 292, 311
Lantana delicatissima.....	428
Lapageria rosea.....	216
Larch, an enemy of, on the High Alps.....	238
— substitutes for.....	483
Lasthenia glabrata.....	256
Lathyrus latifolius.....	327
— splendens.....	327
Lawson, George, death of.....	490
Leaves, autumnal changes in.....	383, 392
— autumn color of.....	437
Ledger, Mr. Charles, sketch of.....	520
Legislation against plant pests.....	41
Leichtlin, Max, articles by.....	188, 327, 477
Leiophyllum.....	493
Lemons in southern California.....	168
Leonotis Leonurus.....	437
Leptosyne gigantea.....	479
Leschenaultia biloba major.....	234
Lespedeza bicolor.....	334
— Sieboldii.....	446
Lettuce, cultivation of.....	46
— forcing.....	138, 270
Lettuces, Cos,.....	90
Leucojum vernum.....	334
Leucojum racemosum.....	463

Leucothoe acuminata.....	479
— ciliolata.....	462
Lewisia pedunculata.....	218
Leycesteria formosa.....	234
Liocula grandis.....	414, 428
Ligustrum Ibotae.....	265
— ovalifolium.....	315
Lilac, Souvenir de L. Spaul.....	234
Lilacs, notes on.....	224
— for forcing.....	157
— in the Arnold Arboretum.....	230, 238
Lilie.....	7, 17, 115, 276, 426
Easter.....	1, 6
Japanese.....	394
Luther Burbank's hybrid.....	328
Lilium, Alexandre.....	115
— auratum.....	17
— and varieties.....	115
Columbianum.....	277
croceum.....	277
elegans, forms of.....	37
Grayi.....	17
Henryi.....	7, 115, 254, 396
Nepalense.....	7
Philadelphicum.....	17
testaceum.....	277
Wallacei.....	17
Wallichianum superbum.....	7, 115
Lily, Melpomene.....	438, 478
— of the Valley, Fortin's variety	205
Limnocharis Plumieri.....	333
Linaris Dalmatica.....	397
Linder Benzoin.....	174
— in eastern Asia.....	500
Liparis litifolia.....	422
— Leuceli.....	283, 422
Lippia citriodora.....	180
Liquidambar styraciflua.....	440, 446
Liriodendron tulipifera.....	364
Litsca geniculata.....	374*
Littornias.....	317
Lobelia heterophylla.....	358
Locust, the Black, in the west.....	62, 503
— the Honey, in the west.....	112
Lodeman, E. G., articles by.....	159, 336, 398
London, open spaces in.....	10
Lonicera flava.....	274
— fragrantissima.....	25
Hildebrandii.....	263
— orientalis.....	405
Ruprechtiana.....	296
— sempervirens.....	346
Standishii.....	25
Sullivantii.....	274
Lotus in Egypt, the Sacred.....	378
— peliorhynchus.....	290
Lourya campanulata.....	14
Lowe, Victor H., article by.....	314
Lucilia gratissima.....	17
Luddemannia triloba.....	483
Ludwigia alternifolia.....	302
Luffa cylindrica.....	418
Lumber industry in Maine, the.....	300
— meaning of.....	100
Lumbermen and forestry.....	102
Lyall, Dr. David, death of.....	310
Lycaste Skinneri.....	156
Lynchnis Chalcedonica.....	397
— Coccinea.....	314
— vesperina.....	307
Lycopsis arvensis.....	214
Lycoris squamigera.....	84
Lyonothamnus floribundus.....	479
Lysimachia clethroides.....	337
Lythrum Salicaria.....	278, 330

M

MacElwee, Prof. Alexander, article by.....	475
MacMillan, William, paper by.....	82
Magnolia Campbellii.....	153
— glauca.....	403
— hypoleuca.....	161
— macrophylla.....	161*
— parviflora.....	170
— stellata.....	195
— the Swamp.....	260
Magnolias as garden plants.....	161*, 166
Malope malacoides.....	305
Malva alcea.....	307, 397
— fastigiata.....	314
Manning, J. Woodward, articles by.....	366, 396, 406
Manure, stable, value of.....	90
Maple, the Norway.....	450
— the Striped.....	396
— trees, sap of.....	150
Maples, Japanese, in California.....	302
Marantas.....	407
Marica cerulea.....	146
Marsilia quadrifolia.....	304
Martinezia carotefolia.....	466
Masdevallia Forgetiana.....	454
— melanoxantha.....	144
Massay, Prof. W. F., article by.....	385
Maurandia Barclayana.....	117
Maxillaria Lindeniae.....	124
— sanguinea.....	144
Medics in Texas.....	193
Meelhan, Joseph, articles by.....	118, 217, 518
Mellichamp, J. H., article by.....	139
Mertensia Virginica.....	109, 207
Mesembryanthemum pomeridianum.....	256

Mexican travel, notes on.....	272
Menya erecta alba.....	486
Micromeria rupestris.....	327, 470
Microstylum macrochila.....	354
Milla biflora.....	107
Miller, Wilhelm, article by.....	466
Miltonia Clovesii.....	496
— vexillaria.....	227
— virginalis.....	234
Fairy Queen.....	194*
Miltonopsis Bleuie virginalis.....	234
Mimulus Clevelandi.....	132*
— ringens.....	363
Mina sanguinea.....	117
Mische, Emil, article by.....	497
Missouri Botanical Garden, notes from the.....	497
— effect of the winter in.....	179
Mold, the cherry fruit.....	137
Monarda didyma.....	327
Monolepis chenopodioides.....	193
Monuments, public, inscriptions on.....	87
Morina elegans longifolia.....	297
— longifolia.....	327
Mormodes Rocheanum.....	53
Morus rubra.....	223
Muhlenbeckia complexa.....	166
Mullein-plant for ornament, the.....	299
Municipal improvements, taxation for.....	218
Musa Sapientum rubra.....	454
Muscari Scovitzianum.....	109
Museums in Kew Gardens.....	224
Mushrooms, cultivation of.....	27
Myosotidium nobilis.....	323
Myosotis palustris semperflorens.....	397
— species of.....	106
— versicolor.....	213
Myrosma canneefolium.....	229, 319

N

Narcissi, hardy.....	166, 17
Narcissus Bulbocodium monophyl-lus.....	44
— Corcyrensis.....	4-9
— notes.....	267
— triandrus pulchellus.....	220
Nature and American literature.....	101
Nebraska, ornamental shrubs for.....	403
— state horticultural society, meeting of.....	47, 57, 17
Nehrling, H., article by.....	67
Neubium speciosum.....	313, 317
— in Egyptian tombs.....	312
Neumbiums, cultivation of.....	97
Nepenthes bicalcarata.....	220
Nephrolepis exaltata plumosa.....	475
Nephthytis picturata.....	499
New York botanical garden, the, chrysanthemums in.....	406, 483
— Cut Flower Company, the.....	452, 461
— woodlands, notes on western.....	342, 352
Nicholson, George, article by.....	173
Nicotiana affinis.....	106, 147
Ngella Damascena.....	314
North Carolina, gardening in.....	312
Nurserymen at Indianapolis, convention of.....	231
Nuts, Souari.....	513
— the germination of.....	6, 44
Nymphaea flammea.....	176
Laydekeri rosea.....	198, 241
— Marliacea Ignea.....	276
O'Marana.....	185
Robinson.....	276
Nymphaeas, hardy.....	207
Marliac's hardy.....	313
— Mexican.....	237
— tender, wintering.....	447
Nyssa sylvatica.....	725

O

Oak, a new hybrid, in the Indian territory.....	463
— forests, scarcity of.....	370
— the Cork, the fructification of.....	52
— the English.....	362*
— the Live, at Drayton Manor.....	232*
— the Red, in Wisconsin.....	200
Oaks, hybrid, in western Missouri.....	32
Oberholser, H. C., paper by.....	312
Ochna multiflora.....	170
Odontoglossum apidorrhinum.....	414
— coronarium.....	14
— Wattianum.....	354
Oenothera fruticosa humifusa.....	183
— Missouriensis.....	207, 256, 278, 2-5
— riparia.....	256
Oenotheras on the prairies.....	253
Oliver, G. W., articles by.....	156, 179, 193, 208, 217, 237, 247, 337, 347, 358, 368, 370, 407, 408, 417, 457, 498, 510
Olivs in southern California.....	103
Olmsted, Frederick Law, papers by.....	101, 202
Ononis	318
Omphalodes linifolia.....	255

P

Oncidium dichromum.....	454
Forbesii	464
— hæmatochilum	240
— varicosum Rogersii	467
Onions, cultivation of	318, 330
Ononis	314
Onosma stellulatum	138
Opicopogon spicatus variegatus	508
Opismenus setarius	193
Opuntia fulgida	324*
Opuntias	324
Orange groves, California	78
Oranges in southern Mississippi	138
Orchard notes from western New York	215
Orchards, air drainage in	306
— irrigation of, in New York	236
Orchid baskets and plant tubs, new	67
society, need of, in America	38
Orchids at Short Hills, New Jersey	37
disease of	433
hints on potting	127
— native	412, 422
Orchis latifolia	394, 414
Orchis spectabilis	228
Orcutt, C. R., article by	428
Orygia leucostigma, the tussock moth	308, 314*
Orobus vernus	216
Orpet, E. O., articles by	17, 36, 38, 56, 57, 87, 127, 138, 148, 156, 166, 167, 187, 207, 227, 257, 288, 297, 387, 398, 426, 447, 467, 478, 486, 517
Osmanthus fragrans	115
Ostrowsky magnifica	266
Ostrya Virginiana, for tanning	293
Oxalis Bowiei	176
Oxydendrum arboreum	495

P

Paeonia tenuifolia	209</
--------------------------	-------

Index.

- Pelargoniums for Easter..... 136
 Penhallo, D. P., article by..... 359
 Pentachæta aurea..... 256
 Pentstemon campanulatus..... 366
 Pentstemons..... 287
 Pepper-tree, the..... 502*
 Peppermint, oil of..... 430
 Perennials, early flowering..... 148, 197
 —— hardy..... 216, 267, 277, 297, 316
 —— late flowering..... 396, 406
 —— some showy..... 287
 Persimmon, the..... 262*
 —— cultivating the..... 75
 Pest of fruit-trees, a new..... 270
 Petrasæ volubilis..... 179
 Petunias..... 106
 Phacelia campanularia..... 314
 Phajus amabilis..... 144
 —— Bernaysii..... 113
 —— Cooksoniae..... 274
 —— grandifolius..... 117
 Phalænopsis, F. L. Ames..... 54
 —— intermedia Portel..... 94
 —— Luddie-violacea..... 354
 —— Youngianum..... 94
 Philadelphia, chrysanthemums in..... 453
 Philadelphia Falconeri..... 494*
 —— Zeyheri..... 254
 Phlox, Carolina..... 256
 —— divaricata..... 198, 209
 —— on the prairies..... 239
 —— Drummondii..... 106
 —— maculata..... 465
 —— paniculata..... 465
 —— subulata..... 198
 Phoenix Robelenii..... 466
 Phosphoric acid appropriated by plants..... 49
 Photinia villosa..... 256, 456
 Phyllagathis rotundifolia..... 334
 Phylloïtonium Lindenii..... 514
 Physalis Franchetii..... 403, 520
 —— glabra..... 479
 Physostegia Virginiana..... 406
 Phytelephas macrocarpa..... 224
 Phyteuma Charmelli..... 257
 Picart, Philibert, death of..... 30
 Picea Canadensis alba..... 222
 —— Marian..... 282
 —— a monstrous form of orientalis..... 44*
 Pinchot, Gifford, article by..... 298
 Pine, a copice of..... 472
 Pineapples in Florida..... 340
 Pine belt, the Long-leaf..... 278
 —— Bull, in the west..... 163
 —— lands in Michigan..... 80
 Scotch, in the west..... 142
 —— the Banksian, in the Nebraska Sand Hills..... 152
 —— the White, industry in the north-west..... 130
 —— in the west..... 132
 —— yellow, in Nebraska, distribution of..... 102
 Pines, a remarkable group of, in New Brunswick..... 332
 —— autumn color in the..... 452
 —— Christmas in the..... 133
 —— early summer in the..... 262
 —— in a dry summer, the..... 362
 —— in California..... 140
 —— in the..... 203
 Pinetum Schoberianum in Holland..... 442
 Pinus Banksiana..... 152
 —— Chihuahuana..... 22*
 —— heterophylla Cubensis..... 222
 —— Koraiensis..... 306
 —— latifolia..... 22*
 —— palustris, the hardness of..... 217
 —— parviflora..... 306
 —— ponderosa..... 163, 392*
 —— sylvestris in the west..... 142
 Pittosporum Tobira..... 359
 Piqueria trinervia..... 516
 —— undulatum..... 124
 Plank, E. N., articles by..... 72, 193
 Plantago maritima..... 213
 Plant-breeding..... 348, 349, 390
 —— at the experiment stations..... 292
 —— pests, legislation against..... 41
 —— variation..... 442
 Plants, common, for ornament..... 299
 —— for shady places..... 47
 —— shy wood..... 209
 Platycodon, cultivation of..... 316
 Pleroma macranthum..... 327
 —— semidecandrum..... 406
 Pleurothallis scapha..... 54
 Plum, Prof. C. S., article by..... 162
 Plumbago Capensis..... 190
 Plums, Japan, in Georgia..... 389
 —— native..... 122, 260, 378
 —— the cultivation of..... 57
 Pogonia ophioglossoides..... 422
 —— pendula..... 422
 Poinssetia, cultivation of..... 14, 417
 Poison Ivy..... 172, 203, 239, 249, 268, 299, 359, 360, 368, 388, 398, 429, 478
 Polemonium reptans..... 228
 Polygalas in the Pines..... 363
 Polygonum compactum..... 403
 —— lanigerum..... 403
 —— orientale..... 493
 —— Sachalinense..... 67
 Polypodium subauriculatum..... 15
 Polyscias paniculata..... 417
 Poplars for western planting..... 122
 —— North Carolina..... 514
 Poppies..... 367
 —— oriental..... 127, 256, 264
 Poppy, the Opium..... 330
 Porcher, Francis Peyre, death of..... 490
 Portulaca, cultivation of..... 106
 Potato scab, cause of..... 400
 —— remedy for..... 410
 Potatoes..... 474
 —— a test for the quality of..... 155
 —— second crop of, in the south..... 280
 —— seed..... 250
 —— sweet, cultivation of..... 57, 210
 Potentilla Anserina..... 213
 —— tridentata..... 213
 Potting soil, sale of..... 470
 Powell, Edwin C., article by..... 388
 Powell, E. F., articles by..... 107, 288, 377, 387, 408
 Powell, G. Harold, articles by..... 368, 378, 407, 417, 439, 448, 498
 Primroses, double English..... 167
 Primula cortusoides Sieboldi..... 225
 —— denticulata..... 197
 —— imperialis..... 304
 —— rosea..... 256
 —— Sinensis..... 36
 Primulas..... 57
 —— Chinese..... 177, 276
 —— in England..... 204
 —— three good greenhouse..... 233
 Pringle, C. G., article by..... 272
 Protea cynaroides..... 34*
 Prunus Bebbeyi for western planting..... 123
 —— Davidiana..... 175
 —— pendula..... 194
 —— serotina..... 22
 —— Simoni..... 368
 —— triloba..... 195
 —— Virginiana..... 370
 Pteris Cretica Owrardii..... 404
 —— species of..... 456
 Purdy, Carl, article by..... 228
 Puschnikia scilloides compacta..... 164
 Putnam, B. L., articles by..... 249, 379
 Pyrethrum parthenifolium..... 236
 —— uliginosum..... 426
 Pyrethrums, flowering, for Easter..... 136
 —— hardy..... 127
 Pyrolas in the Pines..... 493
 Pyrus aucuparia..... 162
 —— coronaria..... 238
 —— crataegifolia..... 290
 —— Japonica, fruit of..... 386
 —— Moeritii..... 189
- Q**
- Quercus agrifolia, insect enemies of..... 170
 —— Arizona..... 92
 —— brevilibata..... 93
 —— Chapmani..... 93
 —— coccinea..... 434
 —— densiflora, tanning properties of..... 293
 —— dumosa..... 93
 —— revoluta..... 93
 Durandii..... 93
 Emoryi..... 13
 Gambeli..... 22
 grisea..... 92
 imbricaria..... 223
 Marilandica \times velutina..... 403
 Muhlenbergii..... 93
 Phellos \times rubra..... 379
 reticulata..... 22, 93
 Suber..... 52
 Toumeyi..... 92*
 undulata..... 13, 92
 Virginia..... 232*
- R**
- Raspberries, for evaporating and drying..... 510
 —— winter protection of..... 420
 Raspberry, the Columbian..... 107
 Raupenheim..... 470
 Raymondia Pyrenaica..... 256
 Red Bud, the..... 184
 Redfield, John H., death of..... 110
 Reidia glaucescens..... 488
 Reinwardtias, the..... 486
 Renanthera Imschootiana..... 274
 Reservations, public, in New York..... 151
 Restio subverticillata..... 385
 Rhamnus hybrida..... 490
 Rhizias..... 362
 Rhinanthus Crista galli..... 213
 Rhododendron, Anthony Koster..... 234
 —— Keiskei..... 23
 —— maximum..... 284
 —— Vaseyi..... 214
 —— viscosum..... 492
 Rhododendrons in a hard winter..... 190, 209, 319
 —— in a natural wood..... 252*
- Rhus copallina..... 326
 —— Michauxii..... 404*
 —— poisoning..... 172, 203, 239, 249, 268, 299, 359, 360, 368, 388, 398, 429, 478
 Ribes aureum..... 190
 Richardia Æthiopica..... 136
 —— Elliottiana..... 34
 —— Rehmanni..... 70
 Riley, Charles V., death of..... 380
 Roads and roadsides, country..... 271
 —— plan for improving, in New Hampshire..... 430
 —— in Rhode Island..... 430
 Robinia Pseudacacia..... 62, 497
 Robbins, Mrs. J. H., article by..... 332
 Robinson, William, article by..... 194
 Rock garden, the..... 205, 249, 256, 318
 Romneya Coulteri..... 7, 357
 Rosa Carolina..... 14
 —— rubiginosa..... 72
 —— rugosa..... 256, 348
 —— setigera..... 280, 463
 —— spinosissima..... 474
 —— Wichuraiana..... 263, 358
 Rose, Belle Siebrecht..... 80, 85, 174*
 Captain Hayward..... 517
 Clio..... 148, 517
 Clothilde Souperf..... 200
 Crimson Rambler..... 117, 166, 233, 250
 Dawson, seedlings of the..... 118
 Double de Coubert..... 263
 Gustave Piganeau..... 516
 Helen Keller..... 370
 J. Sharman Crawford..... 370
 La France..... 410
 Madame Georges Bruant..... 400
 Marchioness of Londonderry..... 148, 516
 —— Mrs. Pierpont Morgan..... 60, 85, 488
 —— Mrs. R. G. Sharman Crawford..... 517
 —— Mrs. W. C. Whitney..... 250
 Susanne Marie Rodocanachi..... 516
 —— the Cherokee..... 114*, 148, 179, 180, 240, 499
 —— the Dawson..... 160
 —— Ulrich Brunner..... 516
 —— garden in Jackson Park, Chicago..... 328
 Rose, N. J., articles by..... 347, 428, 436, 466, 486, 498, 516, 517
 Rose, Prof. J. N., articles by..... 205, 263, 484
 Roses at Kew..... 263
 —— Christmas..... 167
 —— cultivation of..... 146, 200, 476
 —— fertilizing..... 80, 147
 —— hybrid briar..... 85
 —— new..... 118, 120
 —— perpetual..... 386, 487, 516
 —— in Boston..... 139
 —— in England..... 394
 —— winter protection of..... 146
 Ross, Leonard W., article by..... 412
 Rowley, D. M., paper by..... 512
 Rubus crataegifolius..... 48
 Rudbeckia maxima..... 337
 —— subtomentosa..... 375, 497
 Russian tree-fruits in America..... 226, 236, 246
- S**
- Sabbatia, the..... 80
 Saccolabium Mooreanum..... 53
 Saffrons, the meadow..... 436
 Saguenay region, the..... 183, 193, 213
 Saintpaulia ionantha..... 406, 460, 467, 473
 Salix alba \times lucida..... 423*
 —— Famechiana..... 423
 —— balsamifera..... 28
 —— Bebbiana..... 403
 —— Bonplandiana..... 304
 —— candida..... 185
 —— cordata..... 493
 —— lutea..... 473
 —— Mackenziana..... 473
 —— flavescentis..... 373
 —— fluvialis..... 493
 —— lasiandra..... 372
 —— Lyallii..... 493
 —— longifolia..... 43
 —— lutea..... 473
 —— Missouriensis..... 373
 —— nigra..... 303
 —— \times alba..... 423*
 —— Nuttallii..... 493
 —— occidentalis..... 363
 —— Piperi..... 482
 —— taxifolia..... 372
 —— Wardi..... 303
 Salvia Horminum..... 314
 —— patens..... 348
 Sambucus Canadensis..... 270
 —— origin of the name..... 368
 Sand Myrtle, the..... 493
 Sanguinaria Canadensis..... 214*
 San José scale..... 60
 Santa Barbara, notes from..... 388
 Sapindus utilis..... 479
 Saponaria ocymoides..... 199, 208
 —— officinalis..... 406
- Sargent, Prof. C. S., articles by..... 92, 204, 355, 372, 374, 404, 434, 446, 454, 463, 494
 Sassafras Sassafras..... 423
 Sauromatum guttatum..... 5-8
 Saxifraga cordifolia..... 197
 —— crassifolia..... 198
 —— peltata..... 216
 —— pyramidalis..... 261
 Scabiosa Caucasica..... 47
 —— alba..... 467
 Scale insects..... 109
 Scenery, the defacement of..... 81
 Schinus Molle..... 502*
 School-grounds..... 49, 491
 Schomburgkia rhinodora Kimballiana..... 3
 Schools of horticulture..... 471
 Scilla bifolia..... 164
 —— lingulata..... 440
 Scillas in the garden..... 157
 Scott, J. L., article by..... 177
 Scott, William, articles by..... 7, 27, 36, 67, 87, 97, 127, 138, 157, 188, 198, 208, 216, 297, 318, 348, 407, 456, 496
 Sculpture in garden art..... 111
 —— society, national exhibition of the..... 199
 Seacoast planting..... 412
 Sears, F. C., article by..... 519
 Seashore places, small, the treatment of..... 341
 Seavey, Fanny Copley, articles by..... 328, 418
 Seeds, germination of..... 380
 —— vitality of..... 120
 Sedum spectabile..... 366
 Sedums in the garden..... 308, 316
 Seed distribution by the agricultural department..... 12
 —— sowing..... 36
 Seeds, interchange of..... 95
 Semeli androgyna..... 64
 Sempervivums in the garden..... 308
 Senebiæ didyma..... 193
 Senecio aureus and variety..... 193
 —— Japonicus..... 276, 344
 —— macrophylus..... 305
 —— pulcher..... 406
 Serratostylis modesta..... 3
 Shade, plants that like..... 47
 Sherardia arvensis..... 204
 Shina, Charles H., articles by..... 62, 212, 218, 302, 399, 402
 Shortia galacifolia..... 133
 Shrubbery in December, the..... 492
 —— wayside..... 210, 271
 Shrubs, flowering, pruning..... 147
 —— half hardy..... 457
 —— hardy..... 45
 —— ornamental, for Nebraska..... 468
 —— pruning..... 147
 Sidalcea candida..... 397
 Silene cucubalus..... 214
 Silphiums for border plants..... 406
 Sium cicutaceifolium..... 172
 Simulax argyreum..... 305
 —— rotundifolia..... 475
 Smith, Prof. John E., article by..... 352
 Smith, W. R., article by..... 268
 Snowdrops in England..... 144
 —— new and old..... 137
 Sobralia Lindenii..... 444
 —— Lowell..... 354
 —— Veitchii..... 343
 Soil, exhaustion of, by trees..... 142
 Solanum betaceum..... 30
 —— capsicastrum..... 517
 —— Jamesii..... 322
 —— tuberosum..... 322
 Wendlandi..... 387, 477
 Solidago Canadensis..... 458, 499
 —— Drummondii..... 440
 —— odora..... 72
 —— poisonous effect on horses..... 477
 —— sempervirens..... 213
 —— species of..... 213
 Solidagos for border plants..... 406
 Sonchus arvensis..... 214
 Sophora Japonica..... 326, 349
 Souari nuts..... 509
 South Dakota, flora of..... 493
 —— trees of..... 500
 —— Orange nurseries..... 228
 Southwick, Dr. E. B., article by..... 308
 Sparaxis, outdoor cultivation of..... 177
 Sparrow, the European, in America..... 112
 Spathiphyllum commutatum..... 435
 Sphærogynæ speciosa..... 140
 Spigelia speciosa..... 73
 Spiraea, Anthony Waterer..... 314, 386, 467
 —— palmata..... 286
 —— Thunbergii..... 83*, 435
 —— Van Houttei..... 234
 Spiræas, the herbaceous..... 130
 Spiranthæ cernua..... 423
 —— gracilis..... 423
 Sprague, Isaac, death of..... 132
 Spray calendar, a..... 100
 —— pumps, kerosene attachment for knapsack..... 143*, 186*
 Spraying by steam power..... 497
 —— experiments in..... 100
 —— fruit-trees, effect of..... 100
 —— in orchards..... 215
 —— law in Michigan..... 350

Spraying with Bordeaux mixture... 79
Spring in California..... 108
Spruce, black, a monstrous form of the..... 44*
Squash, the Faxon..... 358
Squashes, winter..... 440
Stapelia gigantea..... 454, 514*
Staphylea Colchica..... 157
Staicea Gmelinii..... 406
— latifolia..... 366
— Tartarica..... 297
Steganopticha pinicola, ravages on Larix Europaea..... 238
Stellaria Holostea..... 225
Stenandrium Lindenii..... 305
Stenomesson incarnatum..... 253
Sternbergia Fischeriana..... 144
Stewart, F. C., article by..... 269
Stigmaphyllum ciliatum..... 6, 217, 305
St. Louis, Chrysanthemums in..... 478
Stobaea purpurea..... 406
Stocks, Ten Weeks..... 106
Stones as a source of fertility..... 288
Strawberries, cultivation of..... 318
— good varieties of..... 288
— in Wisconsin..... 298
winter protection of..... 200
Strawberry culture..... 257
leaf curl..... 148
Parker Earle..... 10
plants, packing, for shipment 80
— Stevens' Wonder..... 134
Triumph de Gand..... 140
Street-trees..... 221
— pruning..... 514
Streptocarpus Dyeri..... 5*
Streptocarpus, new hybrid..... 499
Streptosolen Jamesonii..... 8, 399
Strobilanthes anisophyllus..... 77
— Dyerianus..... 134, 348
— isophyllus..... 77
Sturtevant, E. D., article by..... 7
Styrax Americana..... 264
Subirrigation in greenhouses..... 490
Sudworth, George B., article by..... 105
Summer-flowering plants..... 320
Sweet Cassava..... 110
— Pea, Cupid..... 89, 149, 500
— Peas, deterioration of..... 380
— double..... 379
— fall planting of..... 188
— potatoes, cultivation of..... 210
Sycamore for western planting..... 122
Symplocos crataegoides..... 104
Syringas, notes on..... 224
in the Arnold Arboretum. 230, 238

T

Talauma, species of..... 33
Tanning properties of three North American trees..... 293
Tamarix, the Amour..... 468
Taplin, W. H., articles by..... 76, 116,
157, 348, 417, 476
Taxus cuspidata..... 296
Tea, cultivation of, in America..... 98
— of, in Russia..... 25
Tecoma Capensis..... 496

Tecophilæa cyanocrocus..... 186
Ten Bosch, I., article by..... 233
Texas, botanical notes from..... 72, 193
Thalia dealbata..... 314
Thermopsis Caroliniana..... 277
Thomas, John J., death of..... 100
Thompson, William, death of..... 54
Thunbergia erecta..... 14, 376
Tigridia Dugesii..... 107
— pavonia and varieties..... 106
— Van Houttei..... 106
Tigridias, cultivation of..... 507
Tilia Americana..... 355
Tillage, the evolution of..... 53
— the science of..... 49
Timber-culture in Kansas..... 52
Timber, young and old, strength of..... 467
Timothy, experiments with..... 370
Tisdale, William F., articles by..... 78, 168,
258
Tomatoes on potato stocks..... 470
— the Ignotum..... 6, 240
Tomatoes, cultivation of..... 257, 336
— ripening green..... 380
— yellow-fruited..... 138
Torenia Fournieri..... 76, 348
Tourney, Prof. J. W., articles by..... 282,
22, 154, 324
Toxicophloca spectabilis..... 487
Trachelospermum jasminoides..... 238
Tradescantia Reginæ..... 334
Transplanting trees..... 76, 200
Treat, Mrs. Mary, articles by..... 3, 103,
203, 262, 302, 452, 492
Tree-culture in Holland, an experiment in..... 442
— flora of the Chiricahua Mountains..... 12, 22
— leaves, charts of..... 72
Trees and shrubs at Madison, Wisconsin..... 238
— hardy, at Kew
— in South Dakota, list of native..... 4, 9
— instruction about 290
— effect of bad seasons on the growth of..... 81
— exhaustion of soil by..... 142
— four native, in the north-west 173
— of minor importance for western planting..... 122
— pruning street..... 518
— seasonable work among..... 401
— the winter aspect of..... 121*
— transplanting..... 70, 206
Tricker, Wm., articles by..... 86, 97, 237,
439
Tricyrtis hirta..... 417
Trimble, Prof. Henry, articles by..... 293
Trileteia uniflora..... 393
Tritomas, cultivation of..... 397
Troop, J., article by..... 75
Trollius, a hybrid..... 230
— Europeus..... 406
Tropæolum speciosum..... 364
Tulbaghia violacea..... 508
Tulipa Kaufmanniana..... 176
— sylvestris..... 196

Tulips, early, for forcing..... 167
— species of..... 160, 277
Tussock moth, the..... 308, 314*

U

Urceolina pendula..... 516
Utility and landscape..... 2
Utricularias, notes on..... 463

V

Vaccinium corymbosum..... 484

— Pennsylvanicum..... 193

— vacillans, white fruited..... 503

— Vitis Idæa..... 193

Vacciniums in The Pines..... 492

Vail, Anna Murray, articles by..... 282,
312, 378

Vance, L. J., articles by..... 248, 278, 299,
337, 408, 438

Vanda coerulea..... 354, 488

— Kimballiana..... 54, 488

Vanilla, monograph of..... 483

— planifolia, the fruit of..... 10

Van Rensselaer, Mrs. Schuyler,
articles by..... 87, 199, 308

Vaux, Calvert, death of..... 480

Vegetable fibres..... 150

— garden notes..... 46, 158, 257, 336,
377, 416

— trenching in..... 448

Vegetables, adulteration of canned..... 68

— for private gardens..... 126

— two wild..... 223

— under glass..... 64

Ventilation of glass houses..... 20

Ventura, gardens in..... 399

Veronica Buxbaumi..... 198

— longifolia..... 406

— subsessilis..... 337, 350

Vetch, species of..... 214

Viburnum cassinoideum..... 244

— dentatum..... 283

— Lantana..... 484, 518

— lantanaoides..... 109

— Opulus..... 385

— rugosum..... 133

Viburnums, notes on..... 245, 246, 404

Victoria regia..... 333

Villa Lante, the..... 310

Village improvement by women..... 121,
450

Vinca rosea..... 407

Vincetoxicum acuminatum..... 236

Vineyards, Lake Keuka..... 408

Viola odorata Lees Victoria..... 84

— Schönbrunn..... 83

Violet, Czar..... 107

— Farquhar..... 107

— Lady Hume Campbell..... 107

— Marie Louise..... 107

— Princess Beatrice..... 134

— Wellsiana..... 107

Violets..... 66, 87, 106, 506

— native..... 217

Vitis coignetiae..... 509

— labrusca..... 299

W

Wabash Valley, forests of the..... 101*

Walnut, the Black, in the west..... 12, 193

Walnuts, black, germination of..... 105

Water-garden, a winter..... 237

— lilies, Mexican..... 205

Watson, B. M., articles by..... 167, 179

Watson, W., articles by..... 3, 5, 13, 23,

28, 33, 34, 53, 54, 73, 93, 113, 123, 133,

144, 153, 204, 224, 233, 253, 263, 273, 284,

294, 304, 313, 322, 333, 343, 354, 403, 413,

433, 444, 454, 473, 483, 503, 514

Waugh, Prof. F. A., articles by..... 138,
152, 183, 186, 239, 253, 478, 502

Weed, Prof. Howard E., article by..... 180

Weeds, distribution of..... 170

Weeds, and how to kill them..... 240

— destruction of, by electricity..... 310

— extermination along roads..... 350

Weigela, Eva Rathke..... 467

Wellesley, Massachusetts, notes from..... 48, 277, 358, 417, 487

Western New York Horticultural Society, meeting of..... 48, 58, 68, 79

West, future of the arid..... 260

— Virginia, notes from..... 168, 189, 198

Weyman, R. A., article by..... 118

Wight, Lathrop, article by..... 506

Wilcox, Timothy E., article by..... 478

Williams, Thomas A., article by..... 493

Willow, the Diamond, in South Dakota..... 493

Willows for western planting..... 122

— names of some North American tree..... 463

— of North America, some arborescent..... 363, 373, 423*, 473, 482

Winds hot, of the prairies..... 331

Winter protection..... 497

Witches' brooms on Cherry-trees..... 269

Women in village improvement..... 121

Wood in the Comstock mines, consumption of..... 38

Woodlands in western New York..... 342,
382

Woodpeckers and injurious insects..... 349

Wright, Walter C., article by..... 108

X

Xanthoceros sorbifolia..... 199, 497

Y

Yosemite valley, mismanagement of..... 490

Yucca elata..... 22

— macrocarpa..... 22, 301*

— Whipplei..... 414*

Yuccas in the United States, the tree 301*

Z

Zanthoriza apiifolia..... 440

Zygadenus elegans..... 409

ILLUSTRATIONS.**E**

Echinocactus Wislizeni, var., in Arizona..... 155
Ephestia interpunctella..... 324

F

Forest of the Mount Atlas Cedar in Algeria..... 335
— on the bottom-lands of White River, Idaho..... 105

Forests on the Thompson River, British Columbia..... 285

Fothergilla Gardenii..... 445

Fraxinus velutina in Arizona..... 15

G

Gladíolus tristis concolor..... 75
Gunnera manicata in Cornwall, England..... 55

H

Hickory bark, showing galleries made by borers..... 353

K

Kalmia cuneata..... 435

— latifolia myrtifolia..... 317

L

Lamourouxia Pringlei..... 275

Leaf of Columbine mined by Phyto-moya Aquilegia..... 444

Litsea geniculata..... 375

M

Magnolia macrophylla at Wellesley, Massachusetts..... 165

N

Nasturtium officinale..... 104

Nasturtium officinale..... 104

P

Palm Cañon in San Jacinto Mountains..... 475

Pelargonium, Amethyst..... 227

Papaw, the..... 495

Pepper-tree, branch of..... 505

Persimmon-tree near Auburn, Alabama..... 265

Philadelphus Falconeri..... 497

Pine, Yellow, in Nebraska, diagram of distribution of..... 103

Pinus Chiuhuana..... 24

— latifolia..... 25

— ponderosa in the Yosemite Valley..... 395

Protea cynaroides..... 35

Q

Quercus digitata..... 104

— Tourneyi..... 94, 95

— Virginiana at Drayton Hall, South Carolina..... 235

R

Rhododendrons at Westbrook, Long Island..... 255

Rhus Michauxii..... 405

Rose, the Cherokee, a flowering branch of..... 115

— Belle Siebrecht..... 175

S

Salix alba X lucida..... 424

— nigra X alba..... 425

Sanguinaria Canadensis..... 215

Schinus Molle, branch of, with berries..... 505

Spirea Thunbergii..... 84, 85

Sprayers, knapsack, improved attachment for using kerosene with 187

Spray-pump, improved air-chamber of..... 143

— with reservoirs for water and kerosene..... 143

Spruce, Black, a monstrous form of 45

Stapelia gigantea..... 515

Streptocarpus Dyeri..... 5

T

Tussock moth, the white-marked... 315

W

Water-lily, a Blue Mexican..... 206

V

Yucca macrocarpa..... 305

— Whipplei in southern California..... 415

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLE :—The Forests of the National Domain.....	1
Utility and Landscape	Sylvester Baxter.
Christmas in the Pines.....	Mrs. Mary Treat.
FOREIGN CORRESPONDENCE :—London Letter.....	W. Watson.
NEW or LITTLE-KNOWN PLANTS :— <i>Streptocarpus Dyeri</i> . (With figure).	W. W.
PLANT NOTES	5
CULTURAL DEPARTMENT :—Germinating Nuts and Acorns	J. G. Jack.
Notes on Lilies	F. H. Horsford.
Propagating <i>Ficus elastica</i>	William Scott.
Romneya Coulteri	E. D. Sturtevant.
Protecting Peach-trees	Fred W. Card.
Chorozemas, <i>Streptosolen Jamesonii</i>	W. N. Craig.
CORRESPONDENCE :—The Chestnut Weevil.....	R. A. S.
Some Aspects of British Forestry.....	S. A.
RECENT PUBLICATIONS	9
NOTES.....	10
ILLUSTRATION :— <i>Streptocarpus Dyeri</i> , Fig. 1.....	5

The Forests of the National Domain.

THE small company of forward-looking people who, in the face of almost universal apathy, had been for years urging the necessity of some rational system of management for the forests on our national domain, felt greatly encouraged ten years ago when President Arthur was moved to mention the subject in one of his annual messages. We have no systematic forest-policy yet, not even the beginning of such a policy, but we are no longer surprised or unduly elated over the fact that men in places of high authority consider the matter worth talking about, at least. President Cleveland, like his immediate predecessors, in his message to Congress, which assembled last month, strongly advised that some adequate protection should be provided for the areas of forest which had been reserved by proclamation, and he also recommended the adoption of some comprehensive scheme of forest-management. He condemned the present policy of the Government of surrendering for small considerations immense tracts of timber-land which ought to be reserved as permanent sources of timber-supply, and urged the prompt abandonment of this wasteful policy for a conservative one, which should recognize in a practical way the importance of our forest-inheritance as a vital element of the national prosperity.

The House of Representatives, too, has taken prompt action upon Mr. McRae's bill, entitled, An Act to protect Public Forest Reservations. The provisions of the bill are simple. It authorizes the employment of the army to patrol these reservations, as has been done effectively in the Yellowstone Park and in the Yosemite Valley, and it empowers the Secretary of the Interior to make regulations in regard to their occupancy, to utilize the timber of commercial value they contain, and to preserve the forest-cover from destruction. It also empowers the Secretary of the Interior to cut and sell timber on non-reserved lands under the same rules as those made for the forest reservations, provided that it shall be first shown that such cuttings shall not be injurious to the public in-

terests. The bill had some unfortunate features, but any system which regulates the use of public timber is better than the indiscriminate plunder that has been going on hitherto, and the authorization to use the military for protective purposes is altogether commendable. The bill was amended, however, so as to strike out, if we understand it correctly, the provisions relating to non-reserved lands, and it restricts the sale of timber on the reservations to trees that are dead or mature, thus limiting skilled forest practice, instead of authorizing trained foresters to make their own selection, and, worse than all, it grants free supplies of timber from the reservations to miners and settlers.

It is to be hoped that when this measure comes before the Senate that its original features will be restored. In its present form it does little more than to expose the timber on the reservations to new dangers. We are judging, it is true, from the newspaper accounts, and the published text of the bill may show that the amendments are not so bad as they seem. If military protection is assured, that is one step forward, but if such protection is made possible only when the War Department shall consider it worth while, it is a very short step, indeed. No doubt, any measure which gives the assurance of efficient policing of the reservations, or efficiently controls the cutting of public timber, is to that extent a gain, but we certainly want something more definite and decisive than the McRae bill as it now stands.

And, while measures of this sort are being prepared and pressed for passage, why shall we not take immediate steps to examine this magnificent forest-property of ours in a more thorough manner than has yet been done, so that we can obtain facts to guide us in framing future laws, or, at least, to enable us to administer them intelligently? Seven years ago we urged the withdrawal of all these lands from sale until a comprehensive report should have been made by some commission capable of deciding what lands to sell and what to hold forever in forest, and we then proposed that, pending such a report, they should all be put under military protection. Why not provide for such a commission now, and begin the investigation at once? This work would not interfere with the adoption of any protective policy, and certainly we can get no laws which go farther and deeper, and furnish a comprehensive system of forest-management until we have secured possession of forests to manage. The appointment of such a commission need not be deferred until the passage of a protective law. Its creation would be entirely independent of other action. The work of the commission certainly would not obviate the need of forest-protection. It would be in quite another field to furnish facts as a basis for future legislation which shall embrace a detailed management of the forests. If such legislation were devised at once, the very first thing done by the officials created under it would be to make just such a forest-survey as a commission would make. This means that the appointment of such a commission as we contemplate would not disturb the administration of any law, but would in every way be in harmony with it, and help to carry out its spirit.

The nation holds these magnificent forests in trust for future generations. We certainly cannot know too much about their extent, their value and their character, and we cannot learn these things too soon. No Congressman who opposes other forest-laws need object to the inauguration of such a survey, because a commission can do nothing except to disseminate knowledge and furnish facts as a foundation for future action. Even if every recommendation of the commission should be rejected, we can think of nothing which would be a more powerful stimulus to public opinion than a comprehensive report upon our forest resources. The discussion which would be aroused by such a report, with its accompanying recommendations, would be an educational force of the highest value, and our only hope for legislation, immediate or in the future, depends upon the creation of such a public sentiment as will compel action.

Utility and Landscape.

ONE of the most important of problems in landscape-art is the reconciliation of structural utility with the beauty of scenery. It would seem that the problem would solve itself if every structure could be built so as to be in the highest degree both durable and practical. The Romans were not an artistic people, and in their great engineering works, like bridges and aqueducts, it is probable that they gave little thought to the æsthetic effect which such constructions would produce. But the rules that experience has shown to be the proper ones to follow in masonry are those that combine substantial construction with harmonious relations of parts to each other and to the mass, so that good proportions in line and form are always secured. Hence, the Roman works which survive in many parts of Europe, by reason of their stable engineering qualities, are almost invariably picturesque and beautiful features of the landscape. And to-day even the rudest stone bridges in the New England countryside, whether dating back for a century or of recent origin, never fail to delight the eye by fitting naturally into the elements of the landscape.

Doubtless the reason that the average wooden building is so ugly is that we have not yet learned the requirements for the most suitable forms of wooden construction, and the same may be said of such engineering works of iron and steel as the hideous railway bridges that mar the landscape of this country from ocean to ocean. The old-time farmhouse, with walls shingled and weather-beaten, seems to belong to its surroundings as naturally as a lichen-covered rock, and where curved lines are employed in metal construction, as in the great buildings of the World's Fair at Chicago, the effect of aerial grace in the fine, light springing lines is often fascinating in its charm, and the magnificent scene-building of that dream of one summer demonstrated its possibilities for artistic agreement with classic forms in architecture.

It is so frequently the case that the simple expression of the inherent purpose of a structure in the most direct way produces the most agreeable artistic results, that this may be said to be the rule to be observed in aiming for those results. One of the most familiar examples is that offered by the great coal-sheds, which are such prominent features of the water-front in our maritime cities. Beauty is the last thing regarded in their construction. Yet they form elements of remarkable interest in the waterside landscape; built to perform a certain necessary service, everything about them is planned to meet the requirement in the most straightforward way. The huge bulk of the structure, designed to contain enormous masses of coal, is impressive in its own enormous mass; the projections, towers and scaffoldings, built just where they are wanted, are often highly picturesque in their effect, lined sharply against the sky, and reflected in the water; the surfaces, grimy as they are, are not offensive in their hues, and are marked by rich plays of light and shade in the shifting sunshine, and by beautiful atmospheric effects, varying with the conditions of haze and mist, or of crystalline air; and the steamers, barges and sailing vessels, always lying alongside, complete the picturesque interest of the scene.

The way in which maritime commercial conditions may enter into the charm of a landscape is exemplified in a scene like that at the head of navigation on the Neponset River, in the Boston suburbs, where the fresh water of the stream comes tumbling over a dam into the placid salt flood of the estuary and furnishes motive-power to a factory on the bank; on the other side the long slope of a hill is covered with handsome suburban villas, and at a busy wharf the slender spars of vessels rise against the background of a bit of woodland close by the water, and wide levels of salt-marsh border the distant reaches of the river in its course to the bay. This incident of commercial utility in a landscape of exceptional beauty, far from form-

ing a disturbing element, gives a heightening accent to the tranquillity of the scene.

There is a pseudo-æstheticism that affects to regard elements like these as vulgar and commonplace. But genuine artists take them seriously into account as of positive value in a landscape. When the question of designing the Strandway, the handsome shore-drive of two miles, now under construction, along the Old Harbor shore of Dorchester Bay, came before the Boston Park Commission a serious obstacle presented itself in the shape of a great coal-wharf, with an elaborate modern equipment. Mr. Olmsted reported that such a feature was by no means an undesirable thing; it properly belonged to the maritime spectacle, which the drive was designed to command, and would lend interest to the scene. In consequence, instead of taking the wharf, at a cost of probably more than \$200,000, the drive was designed so as to pass outside and cross by a drawbridge a channel giving access to an enclosed dock. In the design of the esplanade and drive for the Cambridge bank of the Charles River, a similar problem of dealing with an interval of wharf property is solved by carrying the way behind the wharves in a manner that does not interfere with convenient access to them.

A problem of utility more difficult to solve is that of the windmill. The old-fashioned windmill of four arms, like those of Holland, which occasionally survives along the New England coast and on Long Island, is always a picturesque element in the landscape. Two of these mills form attractive features of the beautiful "Anlagen" which have taken the place of the ancient fortifications at Bremen. But these clumsy old contrivances are of small efficiency beside the modern devices which have made wind-power of such a varied utility that their sales in the United States are numbered by the hundred thousand each year. Unfortunately the too definite circles which their lines present make it impossible for them to be beautiful features of the landscape. With their enormous tails, or rudders, they give the effect of some form of prodigious insect hovering about the country.

In many parts of the United States the modern windmill is now as distinctive a feature of the landscape as its prototype is in Holland, and is even more numerously represented. It ministers to the convenience, and lightens the labors, of millions of people. In certain villages on Cape Cod, for example, almost every house whose owners are fairly prosperous has its windmill and is supplied with all the conveniences in the way of running water that a city family enjoys. And in Winchester, a Boston suburb of several thousand population, the high service division of the municipal waterworks is supplied by a large windmill at a very considerable annual saving over steam.

With the perfection of the storage battery its power to generate electricity for domestic and other use will insure for the windmill a much wider employment in the future. It furnishes the cheapest form of all motive-power. With a device of such extraordinary value, effecting as it does now an economy of many millions of dollars annually, it would be folly to think of discouraging its use because of æsthetic shortcomings. The true course is to see what may be done to improve it in this respect and give it a form which will unite efficiency with artistic character. To attain this end, economy of construction must be kept in view as the main consideration, for without this popularity could not be looked for. In existing devices a remarkable economy is already reached. But, owing to its inconstancy, wind-power has not been studied as other forms of mechanical energy have been, and it is not unlikely that forms may yet be devised that at a given cost may develop a much greater amount of power than is obtainable from devices now known. The hope is that the ends of use and beauty may be reconciled in the shape which these more efficient forms may take. The artist and the engineer should coöperate for this purpose. If a windmill, acting in a horizontal plane, could be

made as efficient as the perpendicular form now prevailing, it might be practicable to give it a design good in proportion, perhaps tower-like in character, and in harmony with the landscape of which it must necessarily be a conspicuous feature. Possibly much may be done to improve the perpendicular form; but it must evidently be developed upon quite different lines from the old-fashioned windmill, for lightness and simplicity in construction are required in order to secure the greatest amount of energy at a minimum of cost. The circular form is, of course, essential to efficiency, and must be retained. In lightness and strength great advances have been made by the substitution of steel for wood. Still greater advances would seem possible by the use of aluminum, which, being extremely malleable, would seem to be the most suitable substance for very thin wind-surfaces. Being non-corrosive in nature the metal could be used in its natural color, and its light and silvery appearance might produce an agreeable, though novel, effect, not unlike the gleaming of white sails on the blue water. Again, much may perhaps be done to give the supporting structure a more graceful and attractive form, and a pleasing effect might be produced by the training of climbing plants over it. At all events, in view of the increasing prominence of the windmill in our landscapes, the subject seems worth the attention of competent artists.

Boston.

Sylvester Baxter.

Christmas in the Pines.

THE Pines just now remind one of Florida rather than of New Jersey. I never remember to have seen as much freshness in a ramble here at Christmas-time as now appears, and I can hardly realize that these are winter days. The foliage is so green and the berries so bright and plump that it is difficult to associate them with shriveling frosts. Not a flake of snow has fallen, and many warm rains have served to keep up the illusion that somehow this is a belated section of summer. The woods are always fragrant, but now they do not exhale the rich odor of fallen leaves, but the subtle, living aroma of growing Pine-trees, and the spice of shrubs and herbs, which is always so refreshing.

The creeping plants have taken on some of the most brilliant hues. The slender Running Blackberry, *Rubus hispida*, is a study; some of its leaves are a brilliant scarlet, others purple and crimson, while many still retain their deep green hue. The low Sand Blackberry, *R. cuneifolius*, is also holding its leaves, but these are mostly green. The Swamp Rose, too, is green and full of bristly fruit; the Dwarf Wild Rose is conspicuous with its abundant smooth red hips and its persistently green leaves, and the Wild Strawberry covers the ground in places with a carpet of such varied color as to defy description. Some of the Thorns are holding their foliage as well as their fruit, especially *Crataegus uniflora*, which looks much like an evergreen with its thick shining leaves.

But the crowning glory of the Pines at this time is found in the Heath and Holly families. The deep green, glossy foliage of the Laurel was never more handsome than now. Cassandra is showing its flower-buds in all the axils of the small evergreen leaves. The Sand Myrtle, *Leiophyllum*, another pretty little shrub among the Heaths, has an abundance of dark shining leaves, and when not too crowded it has the aspect of a much-branched miniature tree. *Gaylussacia dumosa* is still covered with its thick glossy leaves, quite like an evergreen, and so are many of the Andromedas and Leucothœs. Possibly the long drought of summer has something to do with the unusual persistence of the leaves of the deciduous shrubs. When the early autumn rains came, many of the spring-flowering species blossomed, and new leaves put out, which are not yet ready to loosen their hold. But many of the old leaves, too, still remain on the branches as if they had determined to become evergreen or had forgotten to ripen and fall.

The trailing plants in the Heath family are no less attractive. The Cranberry, with its red fruit and lustrous little leaves running through beds of moss, has a sprightly look that harmonizes well with the wild flavor of its berries. The Trailing Arbutus is showing its clusters of buds, all ready for blossoming next spring. The berries of the Creeping Wintergreen were never larger than they now are and never glowed with a deeper scarlet, and the leaves of the running Chimaphilas were never more thick and substantial. The ever-welcome Holly displays its brilliant berries in clusters of unusual size, and its relatives, *Ilex verticillata* and *I. laevigata*, with fruit equally bright, have never carried a heavier Christmas crop, while the shining leaves and black fruit of *I. glabra* are quite as attractive.

Cone-bearing sprays of fragrant Pine, and the Cedar, with its small blue-gray cones, and the fruit of the Sweet Gum in handsome round heads on long stalks, can be arranged so easily into beautiful combinations that one is tempted to carry them away by the armful for Christmas decorations. The Mistletoe, with its yellowish green leaves and white berries, is here, too, and has a fascination for most people, but I must confess that many of the other evergreens in the Pines are far superior to this in my esteem. Some of the Lycopodiums are highly ornamental, especially *L. obscurum*, which is so like a little tree, and *L. alopecuroides*, with its more stout and thicker stems, can be woven with good effect into almost any arrangement of Christmas green. The long, curved, grass-like leaves of *Xerophyllum* are effective, too, when mingled with other evergreen leaves, and so are the infinitely varied seed-vessels in their sober colors, the cones of the Pine family, Rose hips and other fruits, in bright tints, all of which the Pines now offer in unstinted measure.

Mary Treat.

Vineland, N. J.

Foreign Correspondence.

London Letter.

SCHOMBURGKIA RHINODORA, var. **KIMBALLIANA**.—This plant was named by Reichenbach in 1888, in compliment to Mr. W. S. Kimball, of Rochester, New York, in whose collection it first flowered, producing "a long-branched raceme bearing numerous light purple flowers." A plant of it was shown in flower last week by Messrs. H. Low & Co., at the meeting of the Royal Horticultural Society and received an award of merit. It has narrow pseudo-bulbs eight inches long, hollow, as in all Schomburgkias, and the leaves are six inches long, thick and leathery. The scape is erect, two feet long, in this case bearing only one short branch. The flowers are clustered about the apex of the scape and each one is two inches across, with narrow oblanceolate segments colored bright purple, with a dark crisp margin on the front of the folded lip. It belongs to the same section of the genus as *S. Tibicinis*, and is probably as difficult to flower.

SERRATOSTYLIS MODESTA.—This is a new genus of Orchids, which first flowered in the collection of Sir Trevor Lawrence, at Burford Lodge, in February of last year, and was first described in the *Kew Bulletin*, 1894, p. 158. It was sent to Mr. O'Brien from the Andes of New Granada by Mr. F. C. Lehmann. Mr. Rolfe, who described it, places it next to *Brassia*, although in some of its characters it resembles *Trichopilia* and *Ornithocephalus*. It has linear-oblong smooth pseudo-bulbs two inches long, each bearing a single, broadly lanceolate leathery leaf, seven inches by two inches. The scape, which is developed from the base of the mature pseudo-bulb, is nodding, seven inches long, crowded with flowers in which the segments are equal, spreading, forming a star an inch across, colored light red-brown, margined with pale yellow, the small narrow lip being whitish yellow, with a few purple lines. The column has a pair of wing-like auricles and fimbriated top and an elongated beak-like rostellum. The linear front

lobe of the lip and this elongated rostellum are the most peculiar characters of the genus. A figure of it, prepared from a second plant exhibited at a meeting of the Royal Horticultural Society a few weeks ago, is published in the *Gardeners' Chronicle* this week. It belongs to the modest or purely botanical section of cultivated Orchids, and was accordingly awarded a botanical certificate by the Orchid Committee.

CYMBIDIUM TRACEYANUM.—Baron Schröder again electrified the Royal Horticultural Society by showing this week a magnificent inflorescent from his unique specimen of this grand Cymbidium. It was about three feet in length and bore twenty-one flowers. There is an opinion held by some authorities that this plant is a natural hybrid between *C. giganteum* and *C. grandiflorum* (*Hookerianum*), and certainly the character of the flowers gives support to this view of its origin. As the two supposed parents have, I believe, already been successfully crossed, we shall know in time. In any case, *C. Traceyanum* is the king of all Cymbidiuns.

KLUGIA NOTONIANA.—This is a pretty greenhouse plant which deserves to be better known. Probably it has hitherto failed to attract the notice of horticulturists because it has always been treated as a stove plant and has proved unsatisfactory. In a cool house, however, it behaves very differently. There are plants of it at Kew now a foot across crowded with healthy foliage, and the branches are terminated with racemes of flowers something like Achimenes, but the corolla has one large front lobe, a labellum, in fact. The color is a rich gentian blue, with a blotch of yellow at the base of the lip. In Ceylon this plant is common at an elevation of 5,000 feet, occurring in great abundance in wet places in gullies, and, according to Mr. Nock, of Hakgula, it is always in flower. The natives eat the stems boiled, and they are also used in making curries. *K. Notonian*a is described in the *Flora of British India* as an annual with small flowers. At Kew it is a perennial, and the corolla is over an inch across. It is a Gesneriad and is allied to *Boea* and *Cyrtandra*.

HARDY BAMBOOS.—A series of articles on these plants is appearing in *The Garden* from the pen of Mr. A. B. Freeman Mitford, C.B., M.P., who has a large collection of hardy Bamboos in his beautiful garden at Batsford, near Stratford-on-Avon. Mr. Mitford has been collecting and studying Bamboos for some years, and his observations are rich in practical suggestions for the cultivator as well as for the botanist. I believe it is his intention to republish his articles in book form, with illustrations. Bamboos for the outdoor garden in England have only lately received attention, but already the number that can be grown out-of-doors is extraordinary. At Kew there are between forty and fifty species and varieties which have stood our climate for two or three years. At Batsford the Bamboos are planted in large groups in various positions in the landscape, and they promise to produce in a year or two an effect such as has never before been seen in England.

A LIBERAL GIFT.—A winter garden, which is to cost ten thousand pounds, has been offered by Mr. Henry Yates Thompson (whilom proprietor of the *Pall Mall Gazette*), and accepted by the Liverpool City Council for its largest and handsomest park—namely, Sefton Park. The house is to be octagonal, one hundred feet in diameter, with a curvilinear roof and a central dome rising to a height of seventy feet. The interior is to be planted with Palms, Tree-ferns, Bamboos, Camellias, Rhododendrons, etc., and the whole is to be planned with a view to its affording convenient shelter to frequenters of the park in showery weather as well as for a pleasant promenade in winter. The only condition attached to this generous gift is one which might be looked for from a man of Mr. Yates Thompson's well-known advanced views—namely, that it should be open on Sundays as well as week days.

HARDY TREES AND SHRUBS.—The collection of trees and shrubs grown in the open air at Kew comprises some three thousand species. A list of them has been in preparation

for some time, and the first part of it is now published as "the first of a series of hand-lists of the collections of living plants cultivated in the Royal Gardens, which it is intended to issue from time to time. . . . It is hoped that these lists will be of value in establishing an approximate standard of nomenclature, which is often much confused in gardens, and too frequently erroneous." The part now published contains all the Polypetalæ (*Ranunculaceæ* to *Cornaceæ*), and, with the index, fills 148 pages. It is published by Messrs. Eyre & Spottiswoode, the price being eighteen-pence. [A notice of this book appears on page 9 of this issue.—Ed.]

In 1768 there were 488 hardy trees and shrubs grown at Kew, where, even then, an arboretum had been a feature for some years. The collection gradually grew until in 1845 over one hundred acres of what was then known as the "Wilderness" were added to the gardens with a view to forming a national arboretum. In 1850 a nursery for hardy trees and shrubs was formed, and in 1870 a new pinetum was started. "The late Director, Sir Joseph Hooker (1865-1885), spared no pains to amass the most complete collection which could be formed of hardy woody plants. These were obtained from public and private correspondents and establishments at home and abroad, partly by purchase, partly by gift and exchange." The present Director, Mr. Thiselton-Dyer, has continued the work of planting and improving the collections, which are now unquestionably unrivaled in regard to their comprehensiveness. Kew is not an ideal place for an arboretum; it is too near the bad influence of London smoke, and the soil is poor, in some places mere gravel, with the thinnest crust of soil. Consequently some of the specimens are not of the healthiest character, still, taken as a whole, the collection is certainly without a rival.

Some of the plants included in the list are only hardy in sheltered positions, such as against walls, and a few, although they are tried again and again, have invariably perished in severe weather. Such, for instance, are *Rosa gigantea*, *R. berberifolia*, *Illicium floridanum* and a few others. Generally, however, it may be said of all the plants included in the list that they are hardy at Kew.

The nomenclature is, of course, that of the *Genera Plantarum* and the *Index Kewensis*. It is to be hoped, now that we have a standard list, all who are interested will adopt it, and, by so doing, reduce the present woeful confusion in the names of cultivated plants. Horticulturists want a name only for a very simple purpose, namely, to identify the plant by, and it is desirable that the plant should bear the same name in every country the whole world over. This is asking a great deal, but it is certainly the end to be aimed at.

In the list under notice there are 994 species and 640 botanical varieties, and these have no less than 2,127 synonyms. It has been a task of considerable difficulty, entailing much labor and care, to bring this lot of names into order, and Mr. Nicholson, the curator, whose knowledge of trees and shrubs is unrivaled in England, deserves the thanks of all who are interested in these plants for his share, the principal portion, be it said, of the work. It is only with the vast resources of Kew that such an undertaking could have been brought to a successful issue. When complete, and it is to be hoped that the remainder will soon be finished, the list will be of the greatest use. Each name is followed by the authority, a reference to a figure and the country of which the plant is a native. Then follow the synonyms. The names are printed only on one side of the leaves, this leaving space for additions.

London.

W. Watson.

The dry rustle of the withered Oak-leaves is the voice of the wood in winter. It sounds like the roar of the sea, and is inspiriting like that, suggesting how all the land is sea-coast to the aerial ocean. It is the sound of the surf of an unseen ocean breaking on the forest like water on sand and rocks. It rises and falls, swells and dies away with agreeable alternation, as the sea-surf does.—*Thoreau's Journal*, January 2, 1859.

New or Little-known Plants.

Streptocarpus Dyeri.

THIS is a hybrid between two of the largest monophyllous species, *Streptocarpus Dunnii*, an account and figure of which will be found in GARDEN AND FOREST

through the year till within a few weeks ago. The accompanying illustration on this page is from the photograph of a specimen formed of three plants grown together in a pan, and which, when at its best, was one of the handsomest and most striking flower pictures I have seen for a long time. Each plant had a single leaf two feet long and

Fig. 1.—*Streptocarpus Dyeri*.

(vol. iii., page 609), and *S. Wendlandii*, noted in the last volume of GARDEN AND FOREST (page 134). Both species were in flower together in the summer of 1892, when they were crossed with each other, the seedlings thus obtained flowering in the spring of this year and on all

fifteen inches wide, colored rich olive-green above, vinous purple below, and clothed with soft hairs. The bright red-purple flowers formed a sheaf nearly two feet high. One specimen, a single plant, had an enormous leaf, from the base of which sprang six erect stout racemes, the tallest

thirty inches, the shortest twelve inches high, all crowded with flowers. There must have been at least one hundred open together.

When properly treated this is a noble plant, quite exceptional in its beauty and habit. Seeds sown in March will produce flowering plants by April of the following year. They should be grown in light soil in an intermediate temperature and a sunny position. In America they would probably grow well and flower freely in the open air if treated as bedding-plants. The species ripen seeds freely, but these first hybrids do not. *Streptocarpus Dyeri* has not ripened any seeds with us, and, as the plants perish after flowering, to obtain the hybrid again the cross must be repeated. This, fortunately, is easily done. All the monophyllous species of *Streptocarpus* die after they have once flowered; the others are all perennial.

London.

W. W.

Plant Notes.

IRIS PALÆSTINA.—Well distributed in the Holy Land, there grows a little bulbous Iris of the Juno section, which flowers at this season. It has the usual ovoid bulb, with brown coating and persistent roots characteristic of the group. It can be flowered here only under glass. The small flowers are greenish yellow, not striking or specially attractive. The variety with purplish blue flowers known as coerulea is much more attractive and much resembles *I. alata*, but has not the winged claws of that species and is inferior in size. The showiest Iris of the season is *I. stylosa*, to which we lately referred (vol. vii., p. 454). This species, if strongly grown outside during the summer, will now provide a supply of attractive fragrant flowers in a cool house.

JACOBINIA MAGNIFICA.—This is one of the most floriferous plants of this season in the greenhouse. It is showy, too, and it is grown in quantities on account of its compact habit and its general usefulness as a decorative plant. Old plants grown on from year to year do not make such good plants as those that are raised annually from cuttings. Therefore, when they are done flowering they can be thrown away, except a few that should be kept as stock plants. Cuttings taken in March root easily with the aid of a little bottom-heat. When rooted they are put into small pots of rich open soil and placed in a moist warm house until the end of May. Then they can be planted out in the garden in a sunny position. They require a liberal supply of water during the summer, and attention must be paid to pinching the young shoots so as to make them stocky and keep them from flowering. If properly treated, by the end of August they make handsome little shrubby plants, and should be then taken up and potted in rich light soil. They should be syringed often until they recover from the effects of their change. When the nights grow chilly in September they should be placed in a cool greenhouse where they will get an abundance of light. In a short time they will be covered with large clusters of showy reddish purple flowers, which grow profusely at the ends of the branches, and the plants remain showy for a long time; the flowers do not last long after they are cut.

CROTALARIA LONGIROSTRATA.—Mr. Cameron writes that this plant is now attracting attention in a cool greenhouse at the Botanical Garden in Cambridge. It is a Genista-like plant, introduced from Mexico a few years ago, and is not plentiful in cultivation yet; but when better known, he thinks, it will become a favorite as a cool greenhouse plant. It is a rapid grower, and does not make a shapely plant if it is not pinched frequently when the young shoots are growing vigorously in summer. Well-grown specimens are clothed abundantly with ternate leaves, and the orange-yellow, pea-shaped flowers are produced in terminal racemes. The plants ripen seed and can be increased either by seed or by cuttings; those raised from cuttings in spring make good winter-flowering plants.

STIGMAPHYLLON CILIATUM.—This is a climbing plant from Brazil, and it is sometimes called the Golden Vine, from its

yellow flowers, which at once suggest those of an *Oncidium*, both in their form and in their color. It is a summer-flowering twiner, and it was once thought to require stove treatment, but ordinary greenhouse temperature is what it needs, and in our southern and central states it will flourish out-of-doors and bear its bright blossoms in great abundance. When planted in a greenhouse its flowers cover the young shoots, and in autumn, if it is cut back hard, it will at once begin to make new wood for flowers, which will appear as soon as the lengthening days bring enough sunshine. If it is left, however, and cut back but slightly in the greenhouse, it will bear a few flowers all winter long. This plant does better when planted in the ground than when grown in a pot, and during the hot weather it needs to be syringed quite frequently to overcome the red spider. It is easily propagated by cuttings.

Cultural Department.

Germinating Nuts and Acorns.

To the amateur planter no class of the larger seeds of trees and shrubs causes more disappointments and elicits as many questions as do the various kinds of fruits known as nuts. The cause is generally a lack of knowledge, of proper treatment, or carelessness. It does not seem to be generally understood, although the fact has been stated over and over again in horticultural journals, that many of these seeds retain their germinative power for a comparatively short time after maturity, unless they find the proper conditions for their preservation. The acorns of the White Oak, *Quercus alba*, for instance, often crack and sprout and show the so-called root before the fruit falls from the tree. If these acorns are gathered and allowed to dry for a few weeks before planting it is unlikely that any of them will grow. The same result follows in nature if they fall on ground which is hard and dry and continues so for some time afterward, but if the ground is moist the radicle or incipient root will soon enter it and be secured from drying, unless the soil itself should be deprived of moisture. What is true of the White Oak is true of other species, although often in a much less marked degree. Some of the Black Oak group, for instance, bear acorns which are slower in germinating and appear to preserve their vitality better under adverse conditions. It is destructive to the vegetative power of all acorns to collect them in the autumn and keep them uncovered in an ordinary dry room, to be planted in spring. But any of them may be preserved for months if simply packed or mixed with moist, but not wet, sand, soil or moss, and kept in a cool temperature, such as would prevail under a light covering of leaves or soil in the open air. Similar treatment must be given to Hazel-nuts, chestnuts and to Beech-nuts. In all cases care should be taken to mix in plenty of soil, or to place the nuts in layers so that they do not touch each other, and any tendency to heat and consequent molding should be guarded against. Butternuts, walnuts and Hickory-nuts will not grow readily, or at all, if allowed to become thoroughly dried or cured, although the kernels may preserve a fresh appearance for years after germinative power is lost. They will, however, keep their vitality much better and longer than acorns under the same conditions.

As a rule, direct planting in the open ground as soon as the seed is collected is to be preferred, wherever practicable, for most kinds of nuts and acorns. Among objections to this system are (1) the liability of the larger nuts to destruction by squirrels, of the thinner-shelled ones by mice and some other rodents, or by birds; and (2) the action of frost in heaving the nuts out of the ground. Where the predators can be guarded against, the heaving action of frost may be obviated by a covering of leaves or boards laid over the seed. Some growers aim to plant after hard freezing weather has set in, because there is then less liability to disturbance by animals. In this system of planting an extra quantity of seed is required to allow for failures or mishaps, just as is the rule with many field crops.

Walnuts, Hickories and Oaks generally form long tap-roots, and some persons consider it an advantage to have the seed planted where the trees are to remain permanently, as it is generally found expedient to cut the tap-root when transplanting. When the seed is planted where the tree is to remain experiments have shown that these undisturbed trees make a much faster growth, in their early years at least, than those whose main roots have been cut. In growing a limited num-

ber of these tap-rooted trees the seeds may be planted in shallow boxes, when the roots will take a horizontal direction on reaching the bottom of the box, and they may then be transplanted without much injury.

It is a very common mistake to plant nuts too deeply in the ground. From one to two or three inches is quite enough covering for hickory-nuts and walnuts, especially if the soil is compact. Enough soil to barely cover them will give better results than a covering six inches deep, provided the surface soil is not dry and is not allowed to become so until after the roots have penetrated the ground several inches. A few kinds of acorns will grow if merely left on the surface of moist, shaded soil, and most kinds will be sure to germinate if only the tips are pressed into moist ground and they are not allowed to dry. Enough soil to just cover the acorns is best in all cases. It will be found that a long descending stem, popularly termed the root, is produced before any ascending stem bearing leaves is visible; and for two or three years afterward the plants often seem to spend most of their energies in root-formation. This may be noticed particularly in the White Oak, where the roots will grow several times longer and much thicker than the part of the plant above ground. The apparent growth of the plant at this period seems very slow, but after a good root-system is established the development of the little tree is much more rapid.

The walnuts and Hickory-nuts and many kinds of acorns collected this autumn for planting, and which have not been subjected to unnatural drying, still retain their germinating qualities; but, if not planted at once, they should be placed where they will keep moist and cool during the winter.

Arnold Arboretum.

J. G. Jack.

Notes on Lilies.

AMONG the fifty or sixty species and varieties of Lilies growing here, there are three Asiatic species, which, for me, have had more interest the past season than others, possibly owing to the fact that they are rarer and more expensive than the average, but principally, I believe, from the fact that they have done so much better than I had reason to expect, judging from my experience with other kinds under similar circumstances. The first of these was the new *Lilium Henryi*, which I secured late in the autumn of 1893, and the others are *L. Nepalense* and *L. Wallichianum*, var. *superbum*, received with a second supply of *L. Henryi* early last spring. I obtained the bulbs from England, but they were not, as I understood, taken from a nursery, but had just been brought into England from their native soil. They must have traveled thousands of miles before reaching England, from which place they were reshipped, and by the time they reached me they must have been months out of the ground, and probably had been repacked two or three times. Yet they had not, apparently, suffered from their journey. They were in good order when received and showed no signs of decay. There was such a contrast between their appearance and that of some of the species from the Pacific coast, after a journey of only six or seven days, that I mention these items as among the distinct points in their favor.

There was little difference in the results obtained with the three species. They all came up in due time after planting, sent up good vigorous stems with healthy foliage, and, excepting two or three small bulbs that might not have bloomed had they been left in their original homes, bore good healthy flowers. *Lilium Henryi*, which was first discovered in the mountains of Ichang, of western China, a few years since, is especially vigorous in its growth. Its foliage is thick and healthy, and it seems to belong to a class as easy of culture as the Tiger Lily or common Meadow Lily. I cannot, of course, vouch for its hardiness, but even if it must be covered so as to exclude frost, or taken up in autumn, and, like other tender bulbs, wintered in a cellar, it is a great acquisition and should be in every good collection. Its flowers, in shape and size, are not much unlike those of the *L. speciosum*, and of a bright orange color, with a few purple spots. This Lily did not mature any seed here, possibly owing to the fact that it was planted in the spring, and was consequently late in starting. I have the bulbs covered to exclude all frost and look for much earlier flowers next year. I suppose this heavy covering is not necessary in the case of well-established bulbs, but since it is the most expensive Lily I have, I will postpone any experiments as to hardiness until my stock is larger, or until the price declines.

Lilium Wallichianum, var. *superbum*, is from the central Himalayas. The typical species is mentioned as a greenhouse plant in Nicholson's *Dictionary of Gardening*. It seems

that this variety is much more tractable in cultivation than the typical plant, and the flowers much superior in beauty. Mr. Goldring, in his London letter to *GARDEN AND FOREST* of July 24th, 1889, says of this Lily: "It is, unfortunately, not hardy, but will prove a superb plant for the greenhouse." If Mr. Goldring means that the bulb will not bear freezing, he is, no doubt, quite correct, but if he means that it is too tender for cultivation in the open air, my experience with it last summer would seem to contradict him. It certainly made a very thrifty growth with no better treatment than was given to other common kinds like *L. Canadense*, *L. superbum*, or *L. tigrinum*. The texture of its roots is very firm, and I think it will bear transportation, without injury, farther than most species. Its large trumpet-shaped white flowers, shaded with chocolate outside and delicate primrose-yellow within, are very attractive.

Lilium Nepalense, which bloomed in England for the first time in cultivation in 1888, is also a native of the Himalayas, and, like the other, is said to be a tender greenhouse plant. But it grew here with as much strength and bore as perfect flowers as any plant of *L. tigrinum* that had not been planted longer. The flower of this, though not so striking as some others, is, nevertheless, beautiful—white, with purple within at the base of the petals.

Charlotte, Vt.

F. H. Horsford.

Propagating *Ficus elastica*.

AMONG the more common decorative greenhouse plants there is probably none so hard to propagate as *Ficus elastica*. If only a few plants are wanted, they may be secured by mossing. This is done by removing a leaf from the shoot about a foot from the top, and making a cut from below the joint about an inch long, slanting in an upward direction and extending about half through the shoot. Sphagnum moss should be tied about the cut, and this must be kept damp. In about three weeks the roots will appear through the moss. The shoot should then be cut off just below the moss, and potted with the moss in a three-inch pot, and kept shaded for a few days until the roots get hold of the soil. If plants are wanted in larger numbers this method is too slow, as it is hard to obtain a sufficient number of points. The plan then is to cut the stem into joints about an inch long, leaving a leaf on each joint, and from the side of the joint opposite the leaf the bark and a small part of the wood should be cut. The joints should then be inserted singly into small pots filled with moss and a little fine sand, and these plunged in a propagating-case in a good bottom-heat and kept moist. They soon make roots, and eventually throw up a shoot from the base of the leaf. When their shoots are about two inches high they should be shifted into larger pots, using a compost of equal parts of loam, leaf-mold and sand, and plunged in bottom-heat as before. When fairly started they grow rapidly and soon attain size.

Tarrytown, N. Y.

William Scott.

Romneya Coulteri.—It is pleasant to learn from your issue of November 21st that this most beautiful wild flower of the Pacific coast has lived through the winter in northern New Jersey. My observation of the habits of the plant as found wild shows that it is a perennial with biennial stems. On strong plants the new growths produce flowers freely the first year, sparingly the second year, and then die away. After removal plants must become well established and vigorous before any flowers can be expected. Doubtless, the preservation of the new growths through the winter would add to the strength of the plant the next year. I am very hopeful that Mr. Gerard will be rewarded with flowers next summer, and if so it will be a triumph for eastern horticulture.

E. D. Sturtevant.

Protecting Peach-trees.—Many experiments have been tried in attempting to protect Peach-trees during the winter by covering them with canvas, corn-stalks or some similar material, or by applying some adhesive substance to the branches themselves. Such attempts have never proven satisfactory, however, and the only practicable means appears to be by laying the trees on the ground and covering them over with soil or coarse material of some sort. To many people this, like many other operations with which they are unfamiliar, seems a great task. Experience proves, however, that it is comparatively inexpensive in practice. In setting the young orchard on the college farm last spring this matter was kept in mind, and part of the trees were set with the roots spread out on opposite sides as much as possible, with the intention of laying these trees down every winter as long as they live, if it is found practicable to do this. At least, it is hoped to determine how old

a tree must be before it becomes too unwieldy to handle in this way. To put down these young trees this fall was a very simple operation. Fifty-five trees were laid down and snugly covered with about four hours' work, thus costing only about a cent a tree. Indeed, the ease with which it was done raises the question whether it would not be well to lay down all young trees for the first year or two, until they become thoroughly established and better able to withstand the winter. Of course, the cost will rapidly increase with each succeeding year until the trees reach their full growth.

Lincoln, Neb.

Fred W. Card.

Chorozemas.—These New Holland plants are worthy of a place in every greenhouse, flowering as they do at a dull time of the year, when the last Chrysanthemums have disappeared. They are easily cultivated and readily propagated. Short, firm cuttings, rubbed off with a heel and inserted in bottom-heat of seventy-five degrees now, will make nice plants in six-inch pots in a year's time. For compost, good fibrous loam two parts, leaf-mold one part, and a good admixture of sharp sand will be found suitable when the plants reach a moderate size; some well-dried cow-manure can also be mixed in the soil with advantage. The pots should be drained efficiently and the soil rammed firmly, as for Ericas and other hard-wooded plants. We have frequently seen Chorozemas trained on balloon trellises; treated in this way they make a very pleasing effect with their brilliant flowers and fresh evergreen leaves. They are also effective when trained to pillars and posts, and they are admirable as loose bush plants. They should not be tied up too tightly; if the outer shoots are allowed to droop naturally they will hide the bareness of the lower part of the plant and almost cover the pots. In a cool house they will last in bloom for three months or longer. Early in June they can be plunged outdoors in a bed of ashes, pruned back a little, and treated like Azaleas. They should be housed before danger of frost, although a light frost will not hurt them at all. There are several varieties of Chorozema, including Ilicifolium, Laurenceana, Henchmanni, Cordatum and Cordatum splendens. The last-named variety is the only one we now grow; the flowers are orange and red in color, and are borne in great profusion. We consider it much the best of the family.

Streptosolen Jamesonii.—Too much cannot be said in favor of this as a winter-flowering plant. It begins to flower early in the new year, and lasts until May in good condition, and so floriferous is it that I have seen blooms on it every month in the year. It is easily propagated, and cuttings of soft wood inserted in a good bottom-heat will be nicely rooted in a month's time or less, and if potted on as required fine plants can be had in eight and ten inch pots for next winter's bloom. If grown as a half-standard, with a stem two feet long, it is more effective than when grown in regular bush form; trained in umbrella fashion it also makes a remarkably handsome plant. For compost we use good rich loam, to which is added some cow-manure or pulverized sheep-manure and a little sharp sand. The soil should be pressed moderately firm. The plants do best plunged out-of-doors in the summer and treated as Chrysanthemums are. They will need frequent waterings with liquid-manure when pot-bound. Unless extra large plants are desired, it is best to raise a fresh stock from cuttings each year, and this is a good time to insert them. In Great Britain this plant is better known as Browallia, and it is becoming increasingly popular there. The bright cinnamon-red flowers are of a color distinct from those of almost any other winter-flowering plant, and, although not of any special value for cutting, its lasting qualities merit a place for it in every greenhouse collection.

Taunton, Mass.

W. N. Craig.

Correspondence.

The Chestnut Weevil.

To the Editor of GARDEN AND FOREST:

Sir,—I have been interested in the growing of Chestnuts, and especially in what you have said about the Ridgley Chestnut, but I observe that a writer in the *Rural New Yorker* condemns this variety, as well as the Numbo and Paragon, because of their liability to injury from the Chestnut weevil. He states that the Japan chestnuts are not "wormy," owing to the fact that they ripen early. Now, is it true that our native varieties, or those of European blood, are more subject to attacks from the weevil than varieties of the Japan type, and does the early ripening of chestnuts exempt them from the attacks of this insect? This seems to me to be a very impor-

tant point, for a crop of chestnuts which is largely wormy is useless.

Montclair, N.J.

R. A. S.

[These points we can only answer by reference to experiments which have been made by skilled entomologists. Professor John B. Smith, of the New Jersey Agricultural College, gives an account of the weevil and its work in his report for 1893, and the trees he examined in southern New Jersey did not bear out the views of the correspondent of the *Rural New Yorker*. The fact is, that while imported trees had up to that year been comparatively free from wormy fruit, in 1893 the imported and improved varieties suffered as much as any. The Paragon, which is noted in the *Rural New Yorker* as the most affected, was here the least attacked of any, while the native as well as the Japanese varieties were largely infested. The time of ripening has certainly nothing to do with the trouble, but the time of flowering may have some significance, because the attack is made by the beetles, which appear early in the season, when the Chestnuts are still in bloom. A small hole is bored into the young bur and the eggs are deposited in the embryo nut by the long, slender beak of the beetle. The minute puncture made by the insect heals completely, so that it is impossible when the nuts are ripe to discover how the larvæ entered. These larvæ feed upon the nut and leave it any time between the middle of September and the first of November, when they go under ground for a short distance and remain until the following spring, or, perhaps, lie over until the second year, which is nature's provision for continuing the species if there should be a failure of the chestnut crop in any season. It will be seen from this that there is no period in the life of the insect when it is within reach of the poison. Where the ground is cultivated most of the larvæ are killed by the operation, especially where mineral fertilizers are applied, but Professor Smith advises those who wish to plant improved varieties of Chestnuts in land which is not tilled, to get rid of all the wild trees in the vicinity which might serve to perpetuate the species. As soon as the nuts begin to drop, every nut under the trees should be gathered at once and sent away or destroyed before the larvæ leave them. If it is found that any variety is specially attractive to the insects, trees of this sort should be scattered among those less liable to attack, in the proportion, say, of one tree to ten. The insect will be most numerous under these trees and the ground here should be kept clean so that the nuts can be seen as they fall. The crop from these trees will contain by much the greatest percentage of the larvæ in the grove, and these trees will protect to a certain extent the others. Systematic early gathering will of itself appreciably lessen the number of the weevils. Of course, wormy nuts should not be thrown on the ground, but should be burned. Nuts which cannot be marketed at once should be put into tight boxes or barrels through which the larvæ cannot make their way, and when the nuts are removed the larvæ should be destroyed by boiling water or in some other convenient way.—ED.]

Some Aspects of British Forestry.

To the Editor of GARDEN AND FOREST:

Sir,—This was the title of a paper read by Dr. Somerville, of the Durham College of Science, before the Imperial Institute, at London, December 14th.

The extension of sylviculture in this country was discussed chiefly as an agency for bringing profit to the landlord and benefit to the state. The absence of satisfactory returns from many of our existing woods was traced to excessive initial expenses, unscientific management, game, and the inferior quality, and consequently low price, of much of our home-grown timber. The poor quality of the timber was shown to be largely due to the way in which our plantations are managed, and especially to their being usually over-thinned, and too limited in extent. Reference to the Board of Trade statistics did not justify a common prediction that timber will become both scarce and dear in the near future. If, however, timber-exporting countries are cutting into their capital stock of trees, and are shipping more timber than is annually pro-

duced, a period of scarcity may arise with a suddenness of which the Board of Trade Returns need not be expected to give any indication.

The desirability of the state purchasing land suitable for forestry as a means of providing employment in rural districts was strongly insisted upon. Sylvicultural operations, and the transport of timber to the nearest sawmill or railway station, necessitate the employment of approximately one forester or other workman to fifty acres of wood, while the conversion and utilization of the timber employ an even larger amount of labor. It was pointed out that, at a low estimate, hill pastoral farms are attended to by one shepherd to a thousand acres, so that forestry can find remunerative employment for at least twenty times as many laborers as pastoral farming.

S. A.
London.

Recent Publications.

Hand-list of Trees and Shrubs grown in the Arboretum of the Royal Gardens in Kew. Number 1, Polypetalæ.

This is the first part of a catalogue of the woody plants grown in the National Herbarium at Kew, from the pen of Mr. George Nicholson, the curator of that establishment, to which the lovers and cultivators of trees have been looking forward for several years in eager expectancy, realizing that his precise knowledge and the great opportunities of an establishment like Kew would enable him to produce a work superior in scope and more accurate in detail than any of its predecessors in this particular field.

In Mr. Nicholson's list the families and genera are arranged according to the *General Plantarum* of Bentham & Hooker, and the species under each genus are arranged alphabetically. The species, therefore, are not grouped in sections or other subdivisions, and no characters make it possible for a person cultivating a plant under any given name to verify the correctness of that name by the aid of this catalogue. In some cases, however, this is made possible by a reference to published figures, although no system of the citation of figures appears to have been adopted or followed. The figure, for example, of *Magnolia hypoleuca* in this journal is quoted, while there is no reference to our figure or to any other of *Magnolia Kobus*; there is no reference made to our figure of *Acer Nikoense*, or even to the earlier one in the *Gartenflora*. Nor is there any reference to a figure of *Prunus Alleghanensis*, although it has been figured in the pages of this journal and in Sargent's *Silva of North America*, a work which is often referred to by Mr. Nicholson, although without much system, as all reference to it under the different species of American trees is often omitted. As was to have been expected, for Kew does not occupy itself with questions of priority of nomenclature, no attention is given in this work to the use of the first published name of a species; and this catalogue admirably illustrates how unsatisfactory the system is which permits an author to select or reject a name according to his individual fancy, without reference to priority of nomenclature. Usually Mr. Nicholson takes the best-known name, but not always, so that here is that inevitable mixing up again of systems which always follows the go-as-you-please plan and always results in additional confusion of names.

The valuable part of this publication, and the value of this cannot be overestimated, is the synonymy which has been carefully worked out and includes under each species, in addition to published synonyms, a list of nurserymen, and gardeners' names, which have always been the source of the greatest confusion to students of cultivated trees. The value of this feature is very much increased by an excellent index of the orders, genera, species and synonyms.

Through Glade and Mead: A Contribution to Local Natural History. By Joseph Jackson. Worcester, Massachusetts.

The Country Month by Month. Spring. By J. A. Owen and Professor C. S. Boulger. London: Bliss, Sands & Foster.

We place these two books together, not only because

they both belong to the class of what may be called outdoor books, which form so considerable a fraction of current literature on both sides of the Atlantic, but because they are identical in purpose. This purpose is to furnish to a certain extent a guide for the lovers of nature, especially for those who live in towns, which will to some extent help them when they visit the country by telling them what they may expect to find. The American book is narrower in its range than the other, and is confined chiefly to making a record of the succession of flowers, while its English companion, besides giving a current account of what is going on in the plant-world, is concerned with all sorts of wild life—birds and beasts and creeping things—which one would encounter in a rural walk.

Through Glade and Mead is a stout volume of three hundred odd pages, which, after a brief introduction, describes the salient features of the vegetation of Worcester County, Massachusetts, as they appear month after month from early March till late September. It is not possible in the compass of a hundred pages to write with much detail of many plants, but those which would naturally catch the eye are generally selected, the brief notes about them are accurate, and while there is no effort at picturesque description the work is characterized by good taste and some literary skill. The second part of the book is essentially the record of a single year, in which the dates of the appearance of the wild flowers are given for the year 1882. This is taken as a representative season. Beginning with the Skunk Cabbage, on the third of April, the record continues day by day until the second of October, when the Witch-hazel and Fringed Gentian were in flower, and includes 553 plants. The book has two appendices, one of which is a catalogue of the phænogamous and vascular cryptogamous plants of Worcester County, Massachusetts, and in addition to this flora there is a list of about two hundred trees, shrubs and evergreen flowering plants, which are growing without cultivation in the same county. Among the half-tone illustrations are good pictures of *Ledum latifolium*, *Andromeda polifolia*, the pink Azalea, *Rhodora* and *Leucothoe racemosa*. Five hundred and thirty-five copies of the book have been printed, and of these thirty-five are on large paper, numbered and signed.

This volume of *The Country Month by Month* includes the record of March, April and May, and will be followed by three others to complete the year, and it will very successfully accomplish for English readers what Mr. Jackson's book does for wanderers in Massachusetts' highways and byways. The very titles to some of the chapters which relate to plant-life, such as *By Bank and Copse*, *In the River Meads*, *On a Chalk Sub-soil*, *On Wooded Hills*, *Among Sand Hills and Firs*, *By Ruined Walls*, are alluring, and happily suggest the kind of paths which are to be followed in the various spring rambles. Nor will the reader be disappointed as he follows his guide. Indeed, although it is among Daffodils and Cowslips and Wild Hyacinths that we are invited to walk, the American reader will find these strolls quite as interesting as if they led among his native flowers, while the foreign birds and butterflies, the furry creatures which hide in the coves, and even the Old World snakes and reptiles have a certain fascination which shows that books of this kind have an interest for many who do their botanizing indoors, and who would rather read about insects than to chase them with a net. To all such closet naturalists, as well as those who prefer to observe for themselves, this book can be heartily commended as one of the very best of its useful class.

Notes.

Branches of Tangerine oranges, each bearing a dozen fruits in a setting of dark glossy foliage, now make one of the most attractive features in the fruit-stores. The best of them come from glass houses in southern New Jersey, and sell at the rate of twenty-five cents for each orange.

At the annual meeting of the Ohio Horticultural Society it was said that the commercial cultivation of the Gladiolus was carried on very extensively at Cuyahoga Falls, two growers there having produced more than a million bulbs. One man was reported as selling 300,000 bulbs in a single order for enough money to pay for a small farm.

A California paper announces that a sawmill in Fresno County has prepared a car-load of redwood blocks for shipment to Germany, where they are to be used in making lead-pencils. This is an interesting item, although the accompanying announcement that California redwood will soon entirely displace Florida cedar in this industry is perhaps premature.

The Farmers' Advocate states that persons who have failed to succeed with the Parker Earle Strawberry may have planted it in soil that is too dry. All Strawberries do best in moderately moist ground, and it may be added that weeds do the best there also; but the Parker Earle, in particular, never seems to be at its best until its roots strike permanent moisture.

In the report of the Executive Committee of the American Forestry Association, at its meeting in Washington last week, it was proposed to introduce into Congress bills to provide for obligatory courses of instruction in forestry at the agricultural colleges, as well as a course of lectures at West Point, a post-graduate course at the Department of Agriculture, and scholarships for students in forestry to be sent abroad.

Besides its great parks, London now has 198 open spaces of less than ten acres in extent, with an aggregate area of three hundred and fifty-four and a half acres. Most of these grounds have been secured for public use in comparatively recent time, and the *Gardeners' Chronicle* well says that any one who would have ventured to prophesy fifty years ago that there would have been now nearly two hundred such places for recreation and resort in the great city, would have been laughed at as a dreamer.

Dr. Hoskins says that the Old Nonesuch Apple, which is generally supposed to be of Massachusetts origin, is probably from Canada, as is indicated by its synonym Red Canada, and also by the fact that many old orchards of this variety now exist in Canada. When well-grown upon good ground the Red Canada, like the Fameuse, is a first-class commercial fruit, and it has been shipped this winter to London from Montreal in cases with paste-board divisions which make a cell for each apple, just as egg-boxes do for every egg. Shipped in this way these apples brought from \$5.00 to \$7.00 a bushel as an ornamental table fruit. Their medium and uniform size and color give them great value for this purpose. No doubt, there are other apples besides the Red Canada and the Newtown Pippin which might be shipped in this way at a profit, and our own large cities would take choice fruit so marketed at a good figure. Such apples should be uniform in appearance, size and quality, and some of the earlier varieties like Early Joe might be shipped and sold in this way, but they would need much more intelligent handling than ordinary market apples receive.

Christmas gifts supplied by florists this year consisted almost entirely of boxes of cut flowers, violets and roses being the favorites. Large, deep-colored Marie Louise violets, their long stems allowing of loose, graceful arrangement, sold for as much as five dollars a hundred. Roses cost from three dollars to eighteen dollars a dozen, an extra quality of American Beauty commanding the outside price of three dollars each. Lilacs at twenty-five cents to fifty cents a spray, tulips at one dollar a dozen, large showy heads of Poinsettia at twenty-five cents each, and stevia at fifty cents for a small bunch, were specialties of the holiday season. Carnations were plentiful and cheap; some well-cultivated specimens of William Scott, measuring two and a half inches across, brought the extreme price of two dollars a dozen. The Orchid season is now fairly begun, and cut blooms of Cattleya at nine dollars a dozen, and Cypripedium insigne at four dollars a dozen, were in good supply. Fruited plants of Ardisia crenulata and the Otaheite orange were in some demand, and specimen plants of Cyclamens and of Chinese Primroses in ornamental baskets found considerable favor. But the most beautiful and the most costly were luxuriantly flowered plants of Heath, their foliage almost hidden under the myriad of tiny bells, and a few extra early pink and white Azaleas.

The vegetable supply in New York at this season is remarkably varied, comprising the ordinary fall root-crops of our northern fields, and of Canada and Europe, the more perish-

able green crops held over in cold storage, new vegetables from the Gulf states and from the Pacific coast, and choice hot-house products from adjoining states. The principal supplies of potatoes in our markets now come from Long Island and interior sections of New York state, and from New Jersey, Maine and Michigan. Cargoes have recently arrived from Scotland, England, Germany and Belgium, and new potatoes from Bermuda are already here. The best sweet-potatoes come from Vineland, and West India yams, weighing from five to eight pounds apiece, are occasionally seen. These are cut in quantity to suit the purchaser and sell for fifteen cents a pound. Winterturnips, from New Jersey and from Canada, are abundant and cheap, while small and tender hot-house turnips cost five cents each. Carrots grown under glass may be had for twenty cents a dozen. Florida cucumbers, small and of irregular form, sell at the rate of four for twenty-five cents, the smooth and shapely hot-house product bringing twenty cents each. These have more than their appearance to account for the difference in price, since their crispness and delicate flavor is most marked. Tomatoes from the southern states and from California cost twenty-five to thirty cents a pound, the firm flesh and rich color of hot-house tomatoes making sales for them at fifty to sixty cents a pound. Small bunches of asparagus, from St. Louis, are offered at thirty-five cents each, and slender stalks of the same vegetable, from New Jersey greenhouses, are luxuries which cost as much as \$1.25 for two dozen tips. New okra, from Havana, costs ten cents a dozen, artichokes, from Louisiana, twenty-five cents each, and Florida squashes ten cents. Other vegetables from Florida are eggplants, Brussels sprouts, leeks, peas, string beans and lettuce. Chicory and escarole come from New Orleans, and radishes, spinach and kale from Norfolk. Dandelion grown in cold frames on Long Island finds ready buyers at twenty cents a quart, and the best mushrooms cost \$1.25 a pound.

The so-called Vanilla Bean is not a bean at all, as is well known, but the fruit of a climbing Orchid, *Vanilla planifolia*, the capsule or pod of which is about three-eighths of an inch in diameter and from six to ten inches long, and has a certain resemblance to the so-called Catalpa Bean. The plant in its native home, in Mexico and tropical America, climbs over trees and shrubs by means of slender rootlets sent out from the joints of the stem. It is not a true epiphyte, however, but always maintains its connection with the soil. In its wild state it climbs to a height of twenty feet, but in cultivation it is kept within bounds, so that the unripe pods are not injured when the others are gathered. A late number of *Popular Science News* contains an interesting account of the method of growing the Vanilla, in which it is stated that in Mexico the plant is propagated by cuttings and then trained over some rough-barked trellis-work in partial shade. When the plants were first introduced into the West and East Indies they grew vigorously and produced an abundance of flowers, but no pods. It was discovered that the particular moth which fertilized the flowers in Mexico was absent from its new home, and artificial pollination was resorted to, after which the plants produced abundantly. With a long splint of bamboo the lip of the flower is lifted away and the pollen is transferred from the pockets and applied to the stigma. The work is so easily done that one person can fertilize a thousand flowers in a morning. The pods require a month to reach full size and six months more to ripen. The process of curing is long and complicated, and the aroma of vanilla is said to be produced only by fermentation. In the island of Réunion, in the Indian Ocean, where the plant is grown extensively, the pods are placed in a basket and plunged for half a minute in hot water, then placed on a mat to drain and exposed between woolen blankets to the sun for six or eight days, and kept in closed boxes during the night to promote a slight fermentation. When the pods are perfectly cured they are a dark chocolate color, pliable and free from moisture. When finally prepared, the pods are tied up in bundles, packed in air-tight boxes, and when in prime condition they are covered with a frosting of needle-like crystals of vanillic acid, which, when pressed between the fingers, gives off the characteristic odor. The supply sent to New York is produced in Mexico, and is regarded as of the highest quality. The amount imported amounts to something like 150,000 pounds a year, while on our Pacific coast a portion of the supply is derived from the island of Tahiti, although the quality of this is much inferior. The supply of London comes largely from Mauritius and Seychelles, and the greater part of the vanilla imported into France comes from Réunion. Three years ago more than 500,000 pounds were imported into France from this island, which was twice the amount produced in all the rest of the world.

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TABLE OF CONTENTS.

EDITORIAL ARTICLES:—Parks and Park-planting.....	PAGE.
Seed Distribution by the Agricultural Department	11
Black Walnut in the West	12
Notes on the Tree Flora of the Chiricahua Mountains.—I. (With figure.)	12
J. W. Toumey.	
FOREIGN CORRESPONDENCE:—London Letter.....	12
PLANT NOTES	13
CULTURAL DEPARTMENT:— <i>Epigaea repens</i>	14
Achimenes.—IV.....	15
Notes on Lilies	16
<i>F. H. Horsford.</i>	
<i>Lælia autumnalis</i>	17
<i>E. O. Orpet.</i>	
<i>Luculia gratissima</i> , <i>Euphorbia Jacquiniaeflora</i> , <i>Bougainvillea glabra</i> , <i>Plantsman</i> .	
<i>Chrysanthemums, Old and New</i>	17
<i>J. N. Gerard.</i>	
CORRESPONDENCE:—A Winter Water-garden.....	18
RECENT PUBLICATIONS	18
NOTES	19
ILLUSTRATION:— <i>Fraxinus velutina</i> on the Chiricahua Mountains in Arizona, Fig. 2.....	20

Parks and Park-planting.

If the word "park" in popular usage ever suggested a group of well-defined ideas, it has in these later days lost its distinctiveness, so that to one man it may mean a country fair-ground, and to another a forest, a game preserve, a field for athletic sports, a race-track, an arboretum or a military parade-ground; in fact, it is applied in a confused way to any space that is not roofed over. This is a misfortune, for, when we are discussing questions of park design or park maintenance, or inquiring what are the true functions of a park, or what should be excluded from it as destructive of its value, we must have a clear idea of what it is and what it is for. We have always used the word to indicate primarily a place where the mind and body are refreshed by rural scenery. Of course, a park will also furnish fresh air and sunshine, opportunities for bodily exercise and rest, but beyond these, and more important than these, is the refreshment of mind which comes from the influence of beautiful natural scenery. The paths and roads are not, therefore, merely places to walk in or drive over; their fundamental use is to make the scenery of the park available to persons on foot or in carriages or on horseback, so that they may find that relief and repose which natural beauty alone can bring to city-wearied senses. The value of a city park, therefore, for a city population is greater or less according as the poetic charm of its scenery is preserved and developed. It seems to be an admitted fact also that quiet, pastoral prospects have the greatest intrinsic value in enabling us to resist the wearing influence of city life and recover wasted mental energy, and it, therefore, follows that the best work is not one in which the architectural features predominate, or in which the planting aims to be highly ornamental or decorative. In a paper published during the past year at Vienna, called *Der Park*, by Franz Graf, there is an instructive discussion on the quality of landscape beauty required for a park, part of which will be found in a condensed form in the paragraphs which follow.

A park is more than mere woodland and field, but, on the other hand, it is not a garden in the narrow

sense of the word. The designers of parks invariably fall into errors of disposition and treatment when they forget this distinction. A park is not a garden, although its mere extent is not the distinctive mark of the difference between the two. There are large gardens and there are small parks, and the purpose of both is to awaken pleasurable sensations. In achieving this end, however, a garden is treated like a miniature painting. Flowers and other materials which are in themselves minutely beautiful receive loving attention in every detail. Such a garden delights us with its color, enlivens us with its perfume, cools us with its shade, but here its service ends. A park picture is drawn with a bolder hand, so that delicate work on details is dissipated and wasted. It must have something more than sensuous beauty—broader and grander features which make appeal through the imagination to the nobler faculties. Years ago our ancestors caught the right idea when, tired of the endless avenues and clipped trees of Lenôtre, they began in an imitative way to make copies of nature in their English gardens by mingling grottoes and artificial ruins and brightly colored dairy buildings with their scenery. They aimed to simulate pastoral scenery, but they overshot the mark, forgetting that a park is not a mere imitation of woodland and field any more than it is a series of formal flower-beds.

Of course, a park must be beautiful, for if it does not speak to the eye like a picture it will not appeal to the heart like a song; and if it shows no refinement of taste it falls far below the rank of what a forest, or meadow, or a vineyard may happen to be. It is a happy accident when a forest, which is treated in strict accordance with the forester's craft, chances also to be striking from a pictorial point of view, or when a meadow or vineyard, by reason of the fortunate dispositions of its hills and valleys, its foliage and its water, is beautiful as well as useful. But the first purpose of a park is to secure these results which in the woods and the meadow are happy accidents. Not only is beauty essential to a park; its whole value lies in beauty. But it must be that serene and enduring beauty which is embodied in its essential and permanent features, and not merely the transient and superficial beauty of floral embroidery. It must have dignity of expression, and not mere prettiness.

Again, although a park must be beautiful, it may be bad art to crowd it full of plants and structures simply because they are beautiful. We too often see a huddle of expensive rarities which struggle with each other to reach the light, and yet leave no reposeful spot for the eye to rest upon. This is why stretches of turf and simple wood borders are more refreshing as a spectacle to the weary than any collection of oddities which excite the eye, rather than rest it, by their glowing colors and conspicuous forms. This does not mean that a park should have no beauty of detail, but in the hand of an artist who wishes to produce an effect upon the imagination, a few beautiful things, harmoniously adjusted, mean more beauty for the whole than beautiful objects in such profusion that they cannot be grouped into any quiet and consistent picture. And since we aim at permanent beauty rather than any transient impression, this consideration alone explains why tender exotics, which seem to shudder in a cold climate, and imported novelties, which drag out a homesick life in exile, are not to be compared with native Oaks and Pines, which rejoice in the vigor of health, and grow more beautiful through years, and even through centuries.

This longevity of the noblest trees and their continued growth in dignity and beauty suggest the thought that one who creates a great park must plant for posterity. What is called planting for immediate effect is usually a makeshift, and, like other makeshifts, an expensive blunder. Light is the life of plants, and as the whole plant is condemned to death if it gets no light, any part of it which the sunbeams no longer reach is doomed. The advice to set the sapling where it will have enough light when it becomes a tree is simple, but it is constantly disregarded.

Even if we are planting to exclude some disagreeable object from sight it is better to set the trees so that they can have abundant room for their roots and light for their tops, even though during a few years we must wait patiently for the wall of foliage which is to do duty as a screen. If we plant this screen thickly the offensive object will be quickly hidden, but it will be only a short time before the lower branches give up their struggle for life, and there will remain a roof of foliage with bare trunks which hardly obstructs the view. A much more serious matter it is to destroy a good tree that is in the way. It requires firmness of purpose to destroy an object which is beautiful in itself, but it is much better to suffer a pang for such a loss than to have the life-long vexation of knowing that a tree, though noble in itself, is out of harmony and proportion with its surroundings, or that it compels some inconvenient adjustment of walks or drives, and that it will keep on doing this forever. The proper way is to plan and plant for posterity, and even if the removal of a tree leaves a wound which can only be healed in fifty years, it should be remembered that the sapling planted near it will not only fill its place, but make a complete and satisfying picture which will give unalloyed delight for centuries.

IT is not worth while to restate here our often expressed views on the subject of the distribution of seeds as it has been conducted for years by the Federal Department of Agriculture. We are glad to know that the matter was brought before the Massachusetts Horticultural Society last month, and, on the motion of the Hon. Joseph R. Leeson, seconded by Francis H. Appleton, Esq., the following resolution was unanimously adopted, and copies forwarded to the officials named in it. It is to be hoped that agricultural societies and horticultural societies which are now having their annual meetings will express their views in a similar way, and give the authorities at Washington to understand that the people of the country are tired of this abuse and intend to have it abolished :

Whereas, more than half a century ago improved varieties of seed were sent out by the official then in charge of that work at Washington, to farmers and gardeners of the country, in order that such seeds might be tested and their practical value ascertained, either over others already in use, or as to their value for introduction and cultivation,

And whereas, we recognize that the present distribution of seeds from the Department of Agriculture does not meet the original intention as herein indicated, and has grown to unreasonable dimensions (and has become a gratuitous distribution of seeds that the recipient is often unwilling to use), the cost of such distribution in 1893 having been \$160,000,

We, the members of the Massachusetts Horticultural Society, assembled by our representatives in our hall at Boston, respectfully recommend to the Congress of the United States that the present method of, and appropriation for, the distribution of seeds be abolished; and that in its stead an appropriation be made of sufficient amount (\$35,000 suggested), by which the Department of Agriculture can distribute to the experiment stations, now located in almost every state and territory, such seeds as may to the said department seem wise, and require a report upon the same from the stations, the stations to perform the required work under appropriations already provided for annually; and direct that the Secretary send a copy of these expressions to each of our Senators and Representatives and to the Secretary of the Department of Agriculture at Washington.

Black Walnut in the West.

LIKE the Catalpa, the Black Walnut can only be grown successfully in a limited portion of the plains. It reaches its greatest development in the rich bottom-lands along the Ohio and Mississippi, and its northern limit is Nicollet County, Minnesota. In the west it is found in the eastern counties of Kansas and Nebraska, but I have not heard of its being found anywhere in South Dakota. It has been extensively planted in Kansas and Nebraska, more than any hard-wood tree, except the Ash. In a moist rich soil it grows quite as rapidly as the Ash, and usually more

so. On upland soils, especially where there is a stiff sub-soil, as in most prairies, it does not succeed.

The Black Walnut is a light-demanding tree, and should always be planted far apart among good shade-makers. In this way it will grow tall and rid itself of lateral branches, making a straight clean log, free from faults. Even when planted pure, if set close, the Black Walnut cleans its trunk much better than the Catalpa. At Farlington, Kansas, there are two plats of this tree—one almost pure, and the other a mixture with Wild Cherry, which is a good shade-maker while young. In the pure plat, thirty-five measured trees averaged 3.8 inches in diameter three feet from the ground, and were twenty-four feet high, with laterals within six feet of the ground. In the mixed plat, twenty-six measured trees averaged 4.1 inches in diameter and thirty feet high. They had clean trunks to a height of fifteen or eighteen feet, with very small crowns. The trees in the pure plantation had much larger crowns, and really contained more wood in the aggregate, but since this was largely in branches it was of no value. These trees were set in 1878 as yearlings, and they were, therefore, sixteen or seventeen years old when measured.

At the home of Professor Poponoe, of the Kansas Agricultural College, Manhattan, there is a plat of about two acres of close-planted Black Walnuts which are making a strong and vigorous growth, and they are shedding their lateral branches very well. This plat is in deep soil adjacent to a never-failing spring-stream, so it has abundance of moisture. At Hutchinson, Kansas, Judge Honck planted Black Walnut seed in 1887 on half an acre of sandy loam, with water within ten to fourteen feet of the surface. Last fall about two hundred trees were found on the plat, which averaged about twenty-five feet high, and specimens eight inches in diameter three feet from the ground, were found. In going from Omaha, Nebraska, to Nebraska City I observed a very fine grove of Black Walnuts, averaging fully forty feet high. Good specimens were seen in Hastings and Red Cloud, Nebraska, but only on low deep soil. The tree is doing very well on the farm of the Nebraska State University at Lincoln.

In South Dakota, the Black Walnut is not a success. At the Agricultural College of that state a few specimens remain in mixed plats, set in 1889, but they are weak. At the Colorado Agricultural College there is a plantation of these trees of about an acre in extent, in which these trees are set twelve to eighteen feet apart both ways, resembling an orchard more than a forest-plat. The trees are in vigorous condition, but they have short trunks and large crowns. One of the best measured twenty-one feet high and five inches in diameter three feet from the ground. These trees were grown under irrigation.

Charles A. Keffer.

Notes on the Tree Flora of the Chiricahua Mountains.—I.

BY most people Arizona is thought of as the Sahara of the New World—a land of broad mesas and rugged mountains, where strange Cacti, tall Agaves and wide-spreading Yuccas flourish, while trees and shrubs with broad green leaves and shady foliage are unknown.

It is true that Arizona has unnumbered miles of broad mesas and sand-blown plains, but even here many species of shrubs, besides perennial and annual herbs, find a congenial home. Growing, as they do, where the rainfall is light, where there is little dew or other moisture, where the days are successions of bright sunshine, all the plants of the plains have small leaves, or, frequently, none, a dense pubescence, or thick epidermis. Nature, by lessening or protecting the evaporating surface, enables plants inhabiting these regions to withstand prolonged drought and the scorching heat of an almost tropical sun. The deep green of other regions here gives way to "Arizona green," a color hard to describe—a sombre gray which harmonizes well with the stretches of sand and rock-strewn hills.

Much has been written in regard to the gray vegetation of the Arizona plains. Little has been said, however, about our mountains and broad table-lands, which bear another flora, with leaves as green, flowers as bright, and shade as deep as we find in any other portion of our country.

In a two-months' trip, from Tucson to the Grand Cañon of the Colorado, and return, I have collected more than eight hundred species of Phænogamous plants. Dr. Wilcox has found between five and six hundred species in the Huachuca Mountains. On a recent trip of twenty-one days to the mountain ranges of south-eastern Arizona I collected three hundred and twenty species. The large and varied collections, made by botanists in different portions of Arizona, amply testify to the great diversity in our flora. Our plateaus and mountains give us a vegetation similar to that of more northern climates, while our southern mesas give us a peculiar and interesting one, characteristic of the planes of Mexico.

Arizona has a greater number of forest-trees than any of the other states or territories of equal area west of the Mississippi River; a greater number than Michigan or California, and nearly eighteen per cent. of the species of the United States.

During July I was one of a party who made a trip by wagon over a considerable portion of south-eastern Arizona. We rode about four hundred miles and visited the Santa Rita, Huachuca, Mule, Swisshelm, Chiricahua, Galluro and Rincon mountain ranges. Of all these ranges, the Chiricahuas are the least known, botanically. They have an interesting and diverse vegetation, and especially is this true in regard to the forest flora, since seventy per cent. of all the trees of the state are growing on these mountains.

The Chiricahua Mountains may be termed the northern prolongation of the Sierra Madre range of Sonora and Chihuahua. They occupy a large area in Cochise County, and, like the other ranges of south-eastern Arizona, extend approximately north and south. All these ranges differ considerably from each other as regards their geological formation. Owing to this, and to the fact that they are separated from each other by more or less broad strips of mesa, each is quite different from its neighboring ranges in the prominent features in its flora. A marked distinction is also noticeable in the vegetation of the mesas, when separated by mountains of considerable elevation.

Approaching the Chiricahua Mountains from the west, at the north of the Swisshelm range, we entered White River cañon, ascended this cañon to old Camp Rucker, thence over the divide to San Simon Valley, skirted the eastern border of the mountains to Fort Bowie, and ascended all the important cañons on the east side. These cañons are all thickly wooded. In many places the trees and under-brush are so dense that one can only get through after much effort. The most abundant trees are Oaks, Pines and Junipers. In the lower cañons are Cottonwood, Mesquit, Desert Willow, Black Willow, Silky Willow, Mexican Elder, Soapberry, Mulberry, Mexican Buckthorn, Ash, Box-elder, Junco, Broad-leaved Yucca, Oaks and Acacias. Farther up we find Walnut, Alder, Sycamore, Maple, Locust, Cherry, Bearberry, Hackberry, Oaks, Pines and other conifers. In the foot-hills and lower mountains are two species of Palo-verde, the narrow-leaved Yucca, two Tree Opuntias and two Acacias. On the mountain-sides, at a greater elevation, we find Juniper, Cedar, Mountain Mahogany, Arbutus, Aspen and several Oaks and Pines.

On a limestone cliff at the right, a few miles before entering White River Cañon, are growing a number of specimens of *Bumelia spinosa*, one of which measured thirty feet high and eleven inches in diameter. Here were also fine specimens of *Morus celtidifolia* and *Quercus grisea*. A trunk of the latter species measured twelve feet four inches in circumference. An interesting form of *Q. undulata*, with very undulate leaves, was found growing on these rocks. This is the only form of this very variable species, so far as I have observed, that approaches

a tree in size. Specimens were measured that were from twenty-five to thirty feet high and eight inches in diameter, and with a good clean trunk.

By the side of this cliff, along the wash from White River Cañon, were abundant specimens of *Chilopsis saligna*, *Salix nigra venulosa* and *S. longifolia*, var. The latter is a beautiful tree with rather long drooping branches and small silky leaves. A few specimens measured eighteen inches in diameter; most usually, however, this tree is much smaller. *Platanus Wrightii*, *Fraxinus velutina** (see page 15) and *Juglans rupestris* were occasionally seen, but were not so abundant as they were later. *Juglans rupestris* is more or less abundant in all the mountain ranges of south-eastern Arizona. It is most usually a small tree with white stiff branches; sometimes, however, it grows to a considerable size. Specimens were measured in the Galluro Mountains with trunks twelve feet eight inches in circumference, and long wide-spreading branches. There is a great variation in the size of the nuts of this species; sometimes they are fully an inch and a quarter in diameter, and sometimes they are not one-quarter of that size.

At the entrance of the cañon were a number of large specimens of *Juniperus pachyphloëa*, the most beautiful and symmetrical of all our Junipers. One trunk measured over thirteen feet in circumference. Growing with this Juniper were *J. occidentalis monosperma*, *Quercus Emoryi* and *Alnus oblongifolia*. Among ranchmen *Juniperus pachyphloëa* is known as Juniper, while all the shaggy-barked species are called Cedar. The Cedar is a much more durable timber, and is used extensively throughout this region in building fences and corrals.

Quercus Emoryi is the most abundant and widespread of all the Oaks of Arizona. From a mere shrub on the mountain-side it grows to great size in more favorable localities. One of these Oaks at Rosemont, on the Santa Rita Mountains, has a trunk fourteen feet nine inches in circumference, and the magnificent spread of ninety-six feet. The acorns of this species ripen as early as June, and under the name "biotes" are used for food by Mexicans and Indians. This, together with the small bunch of pubescence at the union of leaf-blade to petiole, are important characters in the identification of this species. Another Black Oak, somewhat similar, but probably a new species, was found on the mountains above Bisbee.

Tucson, Arizona.

J. W. Toumey.

Foreign Correspondence.

London Letter.

BEGONIA SOCOTRANA.—One cannot easily say too much in praise of this Begonia as a winter-flowering plant. It is grown in quantity at Kew, where there are now many specimens of it in flower. The finest examples of it, however, that I have ever seen are now flowering in the nursery of Messrs. F. Sander & Co., St. Albans. They are about eighteen inches high, with five or six stems, in a six-inch pot, the leaves in some cases fully ten inches in diameter, and the flowers very numerous in terminal racemes, their color a most pleasing shade of rose-pink. Is there not some mistake in the note on this plant on page 486, vol. vii., where the flowers are said to be "fully four inches across"? I have never seen any that exceeded two inches. Possibly American treatment may result in flowers twice as large as can be obtained by the best English growers. Here the tubers are started in August in a sunny moist stove, and when the plants are in vigorous growth they are placed near the glass in the sunniest possible position till they flower.

**Fraxinus velutina* is a round-topped handsome tree, thirty or forty feet in height, which ranges from the mountains of western Texas through southern New Mexico and Arizona, southern Nevada and south-eastern California. It is common in northern Mexico, and grows in Lower California. It is usually found in the neighborhood of streams, in elevated cañons, and, occasionally, on dry mesas, where the leaves are thick and leathery, and sometimes coated with a dense velvety tomentum. It is often planted for the shade of its abundant leaves in the towns of southern Arizona and northern Mexico, along the streets and on the borders of irrigating ditches.

BEGONIA REX × SOCOTRANA.—I lately saw a batch of plants in flower of this interesting hybrid in the St. Albans nurseries. They are likely to become favorites in the garden because of their combining the characters of both parents in a pleasing manner. The leaves are like those of *Begonia Rex* in form, but shorter in the petiole and more crowded on the plant, and they are prettily colored as in that species. The flowers are borne in erect sturdy racemes, which stand well above the foliage, and have much of the character of those of *B. Socotrana*, though they are paler in color. Probably, if the hybrid were again crossed with *B. Socotrana* a still better result would be obtained. But there is much to admire in the hybrid as it stands. Messrs. Sander & Co., the raisers, think very highly of it. Apparently the plants are evergreen, as in *B. Rex*, and, therefore, they may prove perpetual flowerers. Time will show. The number of crosses in which *B. Socotrana* is one of the parents far exceeds the offspring of any other species of *Begonia*.

BEGONIA RAJAH.—There are thousands of this new species of *Begonia* in the St. Albans nurseries, where it is planted on rockeries in stoves, on the sides of stages or grown in pots, and it is happy in every position. It was introduced last year by Messrs. F. Sander & Co. from Singapore. The species it most closely resembles is *Begonia gogoensis*, also a native of Malaya, but this has peltate leaves, and is not so pleasingly variegated. *B. Rajah* is dwarf, the leaves about eight inches across, obliquely cordate, and colored dark green, with large blotches of dark brown-purple-brown some would call the color. The flowers are small and whitish. It is only as a foliage-plant that this *Begonia* will find favor, and in this character it is worthy to be ranked with *B. Rex*, *B. Thwaitesii*, *B. decora* and *B. smaragdina*. Messrs. F. Sander & Co. have crossed *B. Rajah* with *B. Socotrana*, and the result is likely to be something good; indeed, no cross, so far as I know, in which the last-named species has been used, has proved other than good in a garden sense.

CALCEOARIA BURBIDGEI.—This is a handsome winter-flowering shrub of great value for the conservatory. It is grown in quantity at Kew, where there are bushes of it varying from eighteen inches to six feet in height, well branched, covered with leaves and bearing numerous large, loose, elegant racemes of bright yellow flowers. Spring-struck cuttings of it grown out-of-doors all summer and potted on as they require, much the same as Chrysanthemums, grow to a good size by autumn, and they will keep on flowering from November to May, or even longer. The plant is of hybrid origin, its parents being the large, somewhat coarse, Peruvian shrub, *Calceolaria Pavonia*, which is hardy against a wall at Kew, and *C. fuchsiae-folia*, also Peruvian, and one of the most interesting of the cultivated species from the fact that in foliage and habit it closely mimics a *Fuchsia*, and in winter it produces its pretty yellow purses very freely. Here it is planted out in a bed of good soil in June, lifted and potted in October, and kept in a cool frame until it flowers. It is hardy in Cornwall.

LOURYA CAMPANULATA.—This plant was introduced into France from Cochin China about seven years ago and was described by Baillon, who named the genus in compliment to the late curator of the Jardin des Plantes, Monsieur Loury. It is closely related to *Peliosanthes* in *Hæmodoraceæ*, resembling that genus in habit, but it has broader foliage than any of the *Peliosanthes* known to me. The flowers and fruit are also like those of *Peliosanthes*, but larger. *L. campanulata* has a root-stock like *Aspidistra*, from which spring numerous leaves eighteen inches long, the petiole six inches and the ovate lanceolate blade twelve inches by four, bright shining green, the margins conspicuously crimped; texture thin, with numerous raised parallel veins running from base to apex. The flowers are borne on a short erect raceme three inches long, and they are fleshy, bell-shaped, half an inch in diameter, pale yellow, with a black-purple disk-like centre. The fruits are three-quarters of an inch long and of a bright china-blue color. The

plant requires stove treatment. It is likely to find favor as a foliage-plant.

CYCLEA BURMANNI.—The macerated leaves of this plant when steeped in water form a jelly which is said to be equal in flavor and as a food to calf's-foot jelly. Dr. Morris recently stated in a lecture on plants which yield extraordinary substances, that a few of the leaves when crushed and placed in water would in a short time form a thick mass of transparent jelly, and that a friend of his during sickness was nourished for some time by jelly thus obtained. The plant is grown in one of the stoves at Kew, but it does not seem to possess this property here. It is a native of Ceylon and Concan. At Kew it is a slender, quick-growing climber, with peltate-oblong leaves four inches long, hairy and dull green. The flowers are small, greenish and borne in long drooping, branching panicles. It is not a plant of any ornamental value, but its jelly-producing proclivities, when grown in tropical sunshine, are interesting and might be turned to account. The genus belongs to the Menispermaceæ and is related to *Cissampelos*.

POINSETTIA.—Every one knows the value in midwinter of this plant, and every one who has a stove grows it. But while it is easy to grow plants to produce heads of crimson leaves varying from nine inches to a foot in diameter, those who can grow them to twice that size are, I opine, few in number. Locality has something to do with it, affecting the color, as it does in the case of *Calanthes*, which are paler when grown near big towns than when removed from the bad influences of smoky fog. The finest Poinsettias I have ever seen, however, arrived here a few days ago from Madeira. They formed the packing for some fine examples of the fruits of "Choco," *Sechium edule*. The rich crimson leaves (bracts) were of exceptional size, the largest being eleven inches long by three and a quarter inches wide, and the whole head was nearly two feet through. Such magnificent heads may be possible in Florida, for instance. They would make the fortune of an English market-grower if he could produce them, or of a flower-dealer if he could procure them fresh.

NATURAL v. UNNATURAL TRAINING FOR CHRYSANTHEMUMS.—Perhaps I have not made myself clear in my criticism on painfully trained specimen Chrysanthemums. I certainly never intended to discredit skill when I wrote in favor of less formal training, though "R. P." suggests as much (see p. 498, vol. vii.). In *GARDEN AND FOREST*, vol. vi., p. 456, there is a picture of what I mean by a naturally grown Chrysanthemum, and I there said that the art of the skilled gardener was needed for the production of such a specimen, though in that case it was hidden. Training should never go in the direction of distortion, unless there are very good reasons for it. We are compelled to use balloon-trellises for *Allamanda*, *Clematis*, *Bougainvillea* and *Gloriosa*, if we want to exhibit them, but not so in the case of the Chrysanthemum. The Rose is sometimes maltreated by exhibitors, who twist and bind the stems with wire in all sorts of odd ways to produce a thing like an umbrella or a fan or some such fancy. All this is in bad taste, and, therefore, is bad gardening. The same narrow view condemns as bad in habit all plants which do not form nice bushy specimens. Anything "leggy" is considered an abomination!

London.

W. Watson.

Plant Notes.

ROSA CAROLINA.—This native Swamp Rose is one of the species which flower late, with the climbing Prairie Rose and *Rosa Wichuriana*, which trails on the ground like a Dewberry. Unlike these, it has an upright habit, and reaches a height of six to seven feet, being the tallest of our wild bush Roses. It is common by waysides and woodsides, especially where the ground is moist, and its flowers, which appear in the middle of July, often last until the middle of August, since they do not open simultaneously, but follow one another in succession. The individual flowers are rather smaller than those of our other

native Roses, but they grow in corymbose clusters, and they have the special merit of possessing that typical wild-rose fragrance which everybody enjoys. A single plant will spread by underground shoots, so that in a few years it will make a large clump, and it is very useful where masses of shrubs of considerable size are wanted. We are led to speak of the Swamp Rose at this time because just now its corymbs of highly colored fruit make a very effective showing above the snow in a few of the shrub borders of Central Park, where it has found its way, perhaps, by some natural means of distribution, although it may have been planted. This fruit is bright scarlet, and it not only clings to the plant all winter, but it keeps its color and remains sound and plump until some early-flowering shrubs like the Japanese Witch Hazel are in full bloom. Altogether, it is one of our native shrubs whose value for park planting at different seasons ought to be more generally known.

but the variety *Excelsum*, or a special strain of this variety called *Harpur Crewe*, which was introduced a few years ago, seemed to give a new impulse to the cultivation of various kinds of the Leopard's Bane, which is the common name of the genus. *Doronicum Caucasicum*, which was known in the early part of this century, is itself an admirable plant for cutting, and is now quite generally cultivated. Of course, the true home of these plants is the outdoor garden, for they are perfectly hardy and among the most showy of border plants; but if they are lifted with care in autumn, potted and placed in a cool greenhouse they will be now large enough to flower, and through February and the early spring months they will bloom abundantly. These large yellow flowers are not only beautiful, but they last well when cut. The variety *Excelsum* blooms later, since it grows to a height of four or five feet, and when at its best it bears flowers three, or even four, inches across, but *D. Caucasicum* will flower much earlier in five-inch



Fig. 2.—*Fraxinus velutina* on the Chiricahua Mountains in Arizona.—See page 12.

POLYPODIUM (GONIOPHLEBIUM) SUBAURICULATUM.—Although this Fern is graceful even when young it never shows its real decorative value until it is fully grown. Its distinctive feature is the pendulous habit of its fronds, which are pinnate and bright green. When placed in a large tub and allowed to grow, these fronds, which are produced in great abundance, will hang down on every side to a length of ten or twelve feet. When placed on a tall pedestal, a specimen four or five feet through and draped to the ground with a dense curtain of green fronds makes a very striking picture. This Fern was brought from the Malayan Archipelago a great many years ago, and is one of the most graceful of the family. The bright yellow fruit-dots, like those of other Polypodiums, are sunk so deeply in the fronds that they make a little protuberance on the other side.

DORONICUM PLANTAGINEUM.—This Composite plant from southern Europe was introduced twenty-five years ago,

pots, and it rarely grows more than a foot tall. *D. Clusii* also makes a good pot-plant, although it is not so sturdy a plant for outdoor cultivation. All *Doronicums* do better in a heavy soil which is retentive of moisture.

Cultural Department.

Epigaea repens.

EPIGAEA REPENS, the Mayflower of some parts of New England, the Ground Laurel or Trailing Arbutus of various localities in eastern North America, has probably excited as much interest as any other hardy plant. Many efforts have been made to domesticate it, and few kinds of plants have so often failed to flourish under artificial conditions. In most cases where transplanting from its natural home is attempted old plants are taken up with as many roots as possible or convenient, and sometimes with earth. They are too often rudely taken from the warm shelter of woods and leaf-covered ground to some position quite different either

in exposure, temperature, humidity or character of the soil. The result is a check in growth, which is generally followed by a degeneration of the plant, which may endure for several years, but finally dies, and what appears like success for one or two years after transplanting may prove a failure at the end of five or six.

In transferring the wild plants from the woods the common mistake is to select plants which are too old. Old plants may be removed safely if an abundant mass of soil is moved with them, so that the roots are not much disturbed, and if care is taken that the new conditions do not differ too greatly from the old. Wherever possible, it is always much the best plan to collect small plants or seedlings, and grow them carefully in a well-prepared bed, or cold frame, of sand, loam and peat for a year or two before planting out permanently. They will, of course, require proper shading and watering. It may be supposed that seedlings are not always easily procured, and it is true that few seedling plants are noticed if we look for them among the heavy covering of leaves which often protect the plants. The best places to procure seedlings will be found along old paths and cart-tracks in the woods, along railroad cuts and embankments where the species abounds, and in other similar situations where the ground has been disturbed or a clearing made.

After some careful observation the little plants may be easily detected even when provided with only three or four small leaves. With proper care these will become robust specimens, and best adapted to thrive under conditions of cultivation.

In localities where the *Epigaea* is not indigenous the modes of propagation employed are division of old plants, layering or by cuttings; but these methods are often slow and unsatisfactory. It may naturally be asked, Why not procure seeds? Fruits and seeds of *Epigaea*, however, are known to few people, even among professional botanists, who are familiar with the sweet, fragrant, shy little flowers. Probably no one has ever procured seeds from a regular dealer. The dry little fruits are not likely to be noticed on the stems of the plants unless they are carefully looked for, and they may be found more plentifully in sunny open places than in more shaded ones. Doubtless, also, in some parts of the country the conditions for seed-production are much more favorable than others. Where seed can be procured it may be sown in pots, boxes or beds of well-prepared and well-pulverized soil composed of loam, peat and fine clean sand in about equal parts, and the whole well drained beneath. The seed should be sown on the surface of the soil and have a very slight covering of earth sifted over it, an amount of soil equal to the diameter of the seed, or scarcely enough to cover it, being quite sufficient. It may then be covered with fine sphagnum or dead moss, and the whole gently and thoroughly watered, and the sphagnum and surface of the soil should not be allowed to become dry afterward. If in a greenhouse or where there is warmth, the first seedlings may appear under the sphagnum in two or three weeks, and soon afterward the sphagnum must be carefully removed and a very slight sifting of additional soil may be added to the surface. Until they are well established the little plants should be shaded from the direct rays of the sun, and the more humid the atmosphere the better they will grow. As soon as they have produced one or two little leaves the plants may be thickly transplanted to pots or shallow boxes, care being taken not to let the delicate roots dry for even a moment, and as they grow and crowd they may be again transplanted and given additional room until they are large enough to be placed in beds or permanent places. Whenever practicable, it is a good plan to start the seeds in a greenhouse, sowing them soon after collecting or during the winter. After the first season the pots or boxes of little plants may be wintered in a cold frame or pit covered with leaves. Thus treated they should bloom in three or four years after the seed is sown.

One cause which contributes largely to the scarcity of seed is the fact that the *Epigaea repens* is practically diœcious—having its pollen-bearing and fruit-producing flowers on different plants—a fact which is not commonly known. An examination of the blossoms from many different plants will show that on some the styles are long and surmounted by perfect stigmas, on others the stigmas are perfect, but styles short. Both of these forms have abortive stamens, inasmuch as they either do not produce good anthers and pollen or the stamens are very rudimentary or entirely absent. On other plants will be found the male or pollen-producing flowers with perfect stamens and abundant pollen, but imperfect stigmas, incapable of being fertilized. Thus not more than half of the plants can ever bear fruit, and cross-fertilization is absolutely

necessary in order to insure seed-production, and this cross-fertilization is probably entirely dependent upon visits from a very few kinds of insects.

As found growing in its native habitat much variation in the size and color of the blossoms of *Epigaea* will always be noted. A careful examination of different specimens will show that there is a marked tendency toward larger size and whiter color among the pollen-bearing flowers, while those plants which produce perfect stigmas and fruiting organs have blossoms which are smaller, but of a richer pink or rosy color.

The flower-buds are fully developed during the summer and autumn preceding the spring blossoming, and in some localities it is not very unusual to find plants in bloom in the late autumn. The fully budded plants are sometimes taken up and potted at the end of the growing season and the blossoms forced in the greenhouse during the winter. As these plants are rarely used afterward, the practice must be regarded as a destructive one, considering the meagre results generally obtained.

Arnold Arboretum.

J. G. Jack.

Achimenes.—IV.

THREE is a group, consisting of seven varieties, which remind us of those last mentioned, as far as colors and manner of growth are concerned, as well as the flatness of the flowers. They are all of medium size and all desirable; *Carinata* is carmine, shaded salmon; *Aurora* is much like it, but darker; *Firefly*, carmine shading to purple and having an orange eye; *Purpurea multiflora* is described by its name; *Williamsi* is salmon-scarlet, with purple and orange eye and fringed petals; *Lady Littleton*, rich crimson; *Rose Queen*, rich rosy-lake, with a large orange spot. The last two are extraordinarily fine.

Of the kinds which still remain to be described, *Magnet*, *Frau Brunnow* and *Madame de Rougemont* are all precisely alike. The flowers are flat, rosy-purple, with orange-spotted throats, and the plant is very free-flowering and desirable under either name. *Alexandra* is very much like it, but bears a trifle darker flowers, and so may claim to be really distinct. *Escheriana* is small, flat, deep velvety-purple, with orange eye; *Hirsuta splendens* is another name for the same kind; *Monsieur* and *Madame Miellez* agree perfectly with each other—color, white with orange and purple eyes. Of the three *Hofgärtner*, *Mastrand*, *Neuner* and *Wendschuch*, the first is exceedingly unlike any other kind, its flowers being of medium size, trumpet-shaped, and of a beautiful lavender color, with a conspicuous white throat thickly spotted with chocolate. Altogether, this is one of the most desirable, but, unfortunately, not easily to be found, for many dealers send out under this name a reddish kind, much like *Leopard*, which has already been described. The second, *Neuner*, is flat, small, reddish purple, with yellow eye; and the third, *Wendschuch*, is the same in size and shape, but colored rose with violet shade. All three are good, the first, perhaps, the best.

Amabilis bears an exceedingly pretty trumpet-shaped flower, small, indeed, but very desirable for its lilac tint, a color very unusual in *Achimenes*. *Camille Brozzoni* and *Autumnalis* are worth having. Both are of medium size, the former flat and pink, with white throat; the latter trumpet-shaped, very deep violet, with white throat. *Pink Perfection* is a large flat flower of a pinkish-purple color. *Sir Treherne Thomas*, also large and flat, deep rose, with orange throat. *Nisida* is, to my mind, one of the very best of all *Achimenes*; it is a long-tubed, large, flat flower, lavender, shading to white at the centre, with a yellow, chocolate-dotted throat; its shape is exceedingly graceful. The true *A. hirsuta* (*Bot. Mag.*, t. 4144) and *A. pedunculata* (*Bot. Mag.*, t. 4077) are genuine species, differing horticulturally in the color of the flowers, the latter being of an orange cast where the others are rosy. Otherwise one description may serve for both: tall, strong plants, bearing in the axils of the upper leaves large, trumpet-shaped flowers on long flower-stalks, and, as the season advances, bulbillæ of small size but the same in shape as the subterranean ones. Both species should be had. *Skinneri* is the same as *A. hirsuta*. *Reticulata* is flat, of medium size, lilac-purple, with dark veins and yellow throat, very neat and pretty. *Semilosse* is tubular, deep crimson, with something of an orange cast. *Ignescens* (synonym, *heterophylla*) has almost no expanded limb, consisting of a tube only, but of an unapproachable brilliancy, a fiery orange at one end gradually changing to a blazing yellow at the other. *Chirita*, which seems identical with *Plectopoma Gibsoni* and *Scheeria Mexicana* of Van Houtte's catalogue, is the strongest grower in the genus, and will even do pretty well out-of-doors. It grows about a foot or fifteen inches

high, and its flowers are large, trumpet-shaped, and of a deep, intense violet-blue, with white throat. *Violacea semi-plena* is a poor, half-double sort, of which the less said the better. *Haageana* and *Ami Van Houtte* belong to the *Longiflora* varieties, but escaped my notice when I dealt with that group; the first is simply the typical *Longiflora*, but the other is very distinct, with its deep yellow eye contrasting with its rich deep purple surface. Dr. *Buenzod* is a flat flower, of a bluish-purple cast, not very distinct; no one need care for it. *La Belle Cracovienne* is flat, purple, with white eye; not needed. *Unique* is purple-magenta, with orange eye; superfluous. Loveliness is much like the last and deserves the same adjective.

This finishes my account, for, though I have many other kinds, they are either not now in the catalogues or not yet sufficiently described in my note-books. The lovely plant we had twenty-five years ago under the name of *Achimenes picta*, was a *Tydea*, and therefore does not belong here; the same may be said of the two *Dicyrtas*, *Candida* and *Warscewiczi*. If any reader of these notes can send me a rhizome of the *A. picta* just mentioned, I shall be glad to send in exchange any of the *Achimenes* I have named, except *Nisida* and *Ignescens*, of which my stock is exceedingly small.

Canton, Mass.

W. E. Endicott.

Notes on Lilies.

WHEN once fairly established, *Lilium auratum*, the Golden-rayed Lily, is an easy plant to manage, and I believe it may be made as permanent as any of the Lilies. It often happens, however, that it flowers but once after the bulb is set. This is as much owing to the manner of planting as to anything; if the bulb is perfectly free from rot, the soil well spaded and enriched to a good depth beneath it, and nothing but sand or a light loam is allowed to come in contact with it, a good root-growth at its base is ordinarily assured. When this is the case the plant will not only bloom the second year, but will produce much larger flowers, and the bulb itself will increase in size. I have seen bulbs which produced good stalks and flowers whose root-growth beneath the bulb was almost nothing. Above the bulb was a dense growth of roots from the surface of the ground to the bulb, and these sustained the stalk and flowers. The bulb, however, degenerated instead of improving, and would not bloom the second year. Not only should the soil be enriched beneath the bulbs, but the surface should also be well fertilized, in order to feed the many roots along the stem above the bulb. It is surprising what an enormous root-growth one of these large healthy bulbs will make if properly set; and, compared with the ordinary size, it is astonishing how large the plant may be made to grow with extra care.

Lilium Philadelphicum, the Wild Orange-red Lily, though usually found in very poor soil, responds to high fertilization as quickly as any species. It requires, however, a light well-drained soil, and it seems useless to attempt to grow it in clay. When a light sand or loam is used it is as easy to grow as *L. Canadense*. It is a very striking plant when it attains its maximum size and is in full flower. Its height, under the most favorable conditions, is more than double that of the ordinary wild plant, and the number of flowers is greatly increased.

The new and rare *Lilium Grayi* of the southern Allegheny Mountains is, I believe, destined to become a popular species, if it ever becomes common enough to be sold at reasonable rates. The bulbs more than double in size in the first season of cultivation. The best collected bulbs I have yet been able to get were poor compared with those that had been cultivated for one season. *L. Grayi* is a fine Lily, and grows two or three feet high, with two or more dark orange-red flowers, spotted inside. In shape and color the flower is not very unlike *L. Bolanderi*, of Oregon, but it is larger; the plant also is much larger and is more easily grown. In size and shape a good bulb of this species is very like that of an ordinary Meadow Lily. It may be propagated from scales like the Meadow Lily.

Few Lilies may be grown with as little care in the preparation of soil and other particulars as *Lilium Wallacei*. It is not a tall species, seldom growing more than fifteen inches high, but its erect salmon-colored flowers, three or four inches across, are very showy. It seems to be one of the reliable hardy kinds which every one should try. It increases fast, and two or three bulbs soon form a mass of bulbs and stems. Although it is easy to grow, it responds to extra treatment, and a mulch of straw-manure in autumn is a good stimulant for it. It likes a little heavier soil than some other species, and when

set in sand is benefited by a mixture of clay and leaf-mold or peat under the bulbs. It transplants well in spring or autumn. Last spring I had twenty-five good bulbs, and the flower-buds were well formed. The place in which they were planted was not sufficiently well drained, so that it was necessary to transplant them. They did not suffer in the least from this treatment, but grew much faster, and were the best plants of *L. Wallacei* in my collection.

Charlotte, Vt.

F. H. Horsford.

Laelia autumnalis.

MEXICAN ORCHIDS take kindly to our system of cultivation under glass. They flower freely, make satisfactory progress each year, and in many instances the bulbs made here are superior to those made in their native land. There are but few exceptions to this rule, *Cattleya citrina* being, perhaps, the most noticeable. *Laelia autumnalis* is one of our best autumn-flowering Orchids, and, among *Laelias*, ranks next in importance to the varieties of *L. anceps*. A few years ago a white-flowered form of *L. autumnalis* was unknown, but there is now a fine plant in the collection of C. G. Roebling, Esq., of Trenton, New Jersey, and as it appeared the other day it is worth going a long distance to see. There were two spikes bearing six flowers each, their color pure white, with no tinge of pink. This collection is especially rich in white forms of *Cattleyas* and *Laelias*, and no opportunity is lost to make it as complete as possible. Perhaps the best of the colored forms of *Laelia autumnalis* is the one known as *L. atrorubens*. This is a rich carmine, and fades less than the commoner kinds. They are all worth growing, since they last so long on the plant, although when cut the flowers of *L. autumnalis* and *L. anceps* keep poorly, presumably on account of the wiry nature of their stems. When left on the plant they may be enjoyed for three or four weeks.

Laelia Arnoldiana seems to be little more than a well-marked form, probably geographical, of *L. autumnalis*, which it closely resembles. It flowers at the same time of year. All of these *Laelias* may be had in bloom at Christmas-time without any trouble.

Mexican *Laelias* like plenty of light in the growing-season; a very light coat of white lead, thinned with kerosene, and, if desired, tinted with chrome-green, is a good shading medium, as it comes off readily in the fall. A green-tinted shade is not so conspicuous in the landscape as a white one. If shade has to be provided early in the year, it is better to thin the white lead with turpentine, as this dries rapidly, and is not liable to be washed off by rain or evaporated moisture, as may happen when kerosene is used. In summer, when the kerosene dries quickly, this objection to its use does not hold.

We use no material but Fern-root for these Mexican Orchids. The resting period in winter, and the consequent drying out of the material, soon kills moss, if it is used, and makes it unfit for the roots, but if Fern-root alone is used, water can be abundantly applied all through the growing season, and with an airy house there is no trouble in growing these Orchids and in producing bulbs as large as are made in Mexico.

South Lancaster, Mass.

E. O. Orpet.

Luculia gratissima.—This is one of the oldest of garden-plants, but, like many other beautiful greenhouse subjects, it has been pushed to one side lately for some reason, possibly owing to the rage for Orchids. It is the first exotic plant whose name I mastered as a child, and I well remember how a specimen planted out in a warm house by my father used to fill the house with the fragrance of its abundant flowers at Christmastime. For a few weeks past the *Luculia* has been a conspicuously beautiful object here, and it is only repeating what it has done for several successive years. A correspondent tells me how beautiful it is in the gardens of Mr. Sturtevant, in California, where it thrives in the open air. It would, no doubt, prove a fine subject for outdoor planting in the climate of Florida, wherever the Poinsettias live outdoors, as they do in the Orange belt. It will endure any amount of sun-heat, and will thrive here in the cool house in winter, so that *Luculia* will flourish wherever the Orange grows well. It is a handsome plant for the greenhouse, and can be cut back after flowering every year so as to keep it in reasonable shape and bounds. *L. gratissima* is hard to propagate, or at least bears that reputation, but if cuttings are put in after the flowers have been cut off, and rooted in a cool house, success is fairly certain. In a warm propagating-house red spider is too likely to attack the plants.

Euphorbia jacquiniæflora is the older and best-known name for a fine old winter-flowering plant now known as *E. fulgens*.

We always count on a fine lot of wreaths of scarlet bracts at this period when choice flowers are scarce. Pot-culture is not good treatment for this plant usually; it is far better to plant it out in a house similar to that in which Roses are grown, it will stand all the sun in summer, and make fine growth that may be trained up under the rafters, or at the ends of the house where it will not interfere with the other occupants.

Bougainvillea glabra is now in full bloom, giving us our winter crop of flowers that are really more useful than those that come in summer, and better colored, too, for in summer the house has to be shaded, and this lessens the intensity of the color of the bright pink bracts. To get the *Bougainvillea* in bloom at this season it is necessary to plant it out in a warm house that is kept at a minimum of sixty-five degrees at night in winter, and when this crop of bloom is cut off, the plant is cut back and allowed to grow again. After flowering it is once more cut back in late August, so that we get two crops of flowers every year. It is a mistake, when planting *Bougainvillea* out, to give it unlimited root-room, the growth will be so luxuriant that it will not flower well, but if the roots are restricted to a square yard of space, with soil two feet deep, the results will be very satisfactory. Now that we have so fine a variety of this old plant as that sent out recently by Sander, it is reasonable to suppose that we shall see more of the *Bougainvilleas* in gardens. They are beautiful greenhouse climbers, doing equally well in a cool or a warm house, the long sprays of bright pink flowers being admirably adapted for table-decoration, and they show well under artificial light.

Boston, Mass.

Plantsman.

Chrysanthemums, Old and New.—Before the Chrysanthemum season passes entirely out of memory it may be worth while to say a word about the yearly accounts of the great improvements made in this flower. Now, it is true that the new flowers which are so much in vogue are large and of great substance, but in all that makes for beauty few of them have any greater value than those which were grown ten years ago. There have been occasional gains in new forms since that time, as, for example, Mrs. Alpheus Hardy and Lillian Bird, and there have been some additions which were noteworthy for other features, as, for example, H. W. Lincoln, Vivian Morel and a few others, but these are exceptional gains. No effort has been made to secure varieties which were better for cultivation in the open air, so that amateurs for the present may as well confine themselves to old varieties, and especially to those with thinner petals, as they are less liable to be injured by frost. Years ago I cultivated the old Peter the Great, a thin-petaled variety, which would endure a surprising degree of cold.

Elizabeth, N. J.

J. N. Gerard.

Correspondence.

A Winter Water-garden.

To the Editor of GARDEN AND FOREST:

Sir,—One of the most quaint and interesting remnants of an old Dutch homestead in Flatbush, now an incorporated part of the city of Brooklyn, is the roomy old mansion built to replace one burned by the American soldiers to deprive the British of its shelter during the Revolutionary War. The white shingled sides are divided by many windows, with their original small panes, and no fewer than seven doors open out into the garden and grounds. This has for many years been the residence of Mr. John McElvery, who is well known for his success with aquatic plants, as well as in other branches of horticulture. A lot, not above a half-acre in extent, provides for trim lawn spaces, two open Water-lily tanks, and masses of the best sorts of garden-flowers from March to November, and this succession of flowers is accomplished by an amateur grower, without any gardener and without any structure that can be dignified by the name of a greenhouse. The human and historic interest of this delightful home-garden is increased by a corner set apart for colonies of bees and cotes of homing pigeons, and by an old-time well, recently covered over, built, as a stone near its curb records, in 1796, and which, until connection was made with the town supply five years ago, furnished all the water used on the place.

By an ingenious arrangement, the result of experiments during the past five years, even winter is converted into a season of flowers, and on one of the coldest days last week I found growing in what looked like a span-roofed cold frame, abundant flowers and foliage of four varieties of tender Water-lilies. In this long, low, glass-covered tank, in its setting of snow frozen so hard that one could walk on its surface, were

some thirty open flowers, pink, blue and white, and many promising buds. A plant of *Nymphaea Zanzibarensis azurea* carried twelve flowers and buds, and several flowers of *N. dentata*, each measured nine inches across their snowy petals. Besides *N. dentata* there were in flower *N. Devoniensis*, *N. Zanzibarensis* and *N. Lotus*, with its smaller and fuller flowers. The leaves of the plants were healthy, and compared not unfavorably with summer foliage, the larger ones being fourteen inches across; new ones continuously appear, so that some have to be picked off from time to time to prevent their decay from overlapping.

Mr. McElvery began with the idea of using the tanks for a winter storage-house for tender and half-hardy varieties of Water-lilies, but successive improvements have developed this flowering winter-garden. The excavation, which measures thirty-two feet in length and six feet in width, was dug three feet deep and the sides and bottom lined with bricks set in Portland cement. This has since been found to be too deep, and a foot and a half of ordinary soil has been filled in; the plants, which are all in pots, are thus brought nearer the surface. The side walls are level with the surface of the ground, above which is a twelve-inch plank an inch and a quarter thick; the water is kept about two inches below the top of the wall. The ridge-pole along the centre supports sashes on either side; these are about fourteen inches above the water at their lower end, with a pitch of eight inches from the ridge-pole. The sashes can be lifted entirely, or, for ventilation, may be pushed down from the top. In very cold weather they are opened two or three inches during the middle of each day, while in less rigorous weather more fresh air is allowed. It is practicable in almost any winter weather to lift a sash for a short time to allow a better view of the flowers, since there is a sufficient volume of warm, steaming air inside to prevent a sudden chill. In very cold weather this rising mist settles in the crevices and joints, and, being frozen, hermetically seals the frame, so that, after a severe night, the sashes cannot be lifted until the sun has thawed them out.

The heating of the tanks is arranged for at one end of the frame, where a small pit, eight feet deep and reached by a perpendicular ladder, contains standing space and a boiler-room three and a half by four feet. The stove, as the arrangements throughout, has developed under Mr. McElvery's hands, and beginning with a small, discarded heater which had made the journey from Scotland years before, a self-feeding box was arranged for coal above the fire-cylinder, which is encircled with a boiler having a capacity of but three gallons. An inch and a half supply-pipe of wrought iron enters the bottom of the boiler, the connection of the hot-water pipe being made at the top of the boiler, a foot above.

The tank was at first divided into four equal sections, each eight feet long, but the middle partition has been taken out, so that there is now a centre section sixteen feet long, with a section eight feet long at each end. A larger surface was found to be desirable to allow more room for the leaves to spread, and Mr. McElvery advises a width of nine feet instead of six, for the same reason, and this wider stretch would still make it easy to reach half-way across to remove the old leaves. The central section and the smaller one nearest the furnace are heated by hot-water pipes; the small section farthest removed has no piping and is used only for wintering half-hardy aquatics and for seedlings. The glass partition above the dividing wall between the first and middle sections is omitted between the middle and end sections, and considerable heat reaches the storage-tank in this way. The first section is heated by a return-pipe which extends through the middle of it, four inches from the surface of the water. For the middle tank another return-pipe is carried along the bottom of the first tank at the side, where it is covered with asbestos and sealed in cement to prevent escape of the heat until it passes into the large section, through which it extends and returns to the boiler. An expansion stand-pipe is provided in each section. Besides these pipes, which have the necessary check cocks, a half-inch pipe is arranged to carry fresh water. With but little care the water is easily kept at a temperature of seventy-five to eighty degrees, which is the best suited to the health of the plants. Snails are kept in check by raising the temperature to ninety degrees once a week, and afterward turning on a spray of cold water, which in winter averages sixty degrees, serving also to freshen the tanks. A chance rise of temperature to 110 degrees did not injure the plants, while an accidental increase to 130 degrees once killed *N. Zanzibarensis* and the hardier varieties.

In the cool section, at the remote end of the tank, are stored Water Hyacinths and some plants of *Nymphaea Mexicana*, which have not proved entirely hardy and have been lost in the open ponds. Here the foliage keeps a bright green all the

winter. *Nymphaea pygmaea*, the yellow *N. helveola* and some seedlings of the Egyptian Lotus are also wintered in this section. The latter, which usually flowers in two years, have not yet bloomed here, though they are past three years old.

During the recent cold wave the plants escaped any injury in the sudden drop from thirty degrees to six degrees, and after two weeks of freezing weather they continue to flower luxuriantly. The sashes are, of course, very close to the flowers, and the snow, after melting and freezing fast, cannot well be removed without damage to the glass. Blankets were thrown over the snowfall of a fortnight ago, and it thawed off in two or three days, with no injury even to the buds. The tops of the pots are from two to six inches below the surface of the water, the older plants requiring sufficient depth of water to float the leaves. The depth of water is not considered a material detail, and while Mr. McElvery uses pots, he prefers pans for young plants. The soil in the pots is one-half good garden-soil and one-half cow-manure. Better success is had with fresh manure, although it causes a green scum, and is likely to ferment and throw the bulbs out of the pots. The scum is removed by overflow a few times at the beginning of the season, when there is no further trouble. This is done by laying a hose in the water, and thus gently floating the surface, rather than playing a hose into the pond from above, with the effect of dissipating the scum through the water.

Behind the ladder which leads into the furnace-pit, an excavation of thirty-six cubic feet gives room for a ton of coal, and at the side of the furnace-pit a door opens into a glass-covered cold pit, seven by ten feet. Here many garden-plants are successfully wintered, and, among others, Amaryllis, Imantophyllums and Azaleas come into flower. In a large collection of the best Crinums, tender varieties, as *C. Kirkii*, *C. ornatum* and *C. amabile*, do especially well, and flower profusely in an average temperature of fifty degrees. The entrance to the boiler-pit is covered with a trap-door, and an extra, heavier door is provided for more complete exclusion of cold and rain. The only other provision against weather is a padding of straw along the sides of the tanks, which is boxed in with boards.

The development of this successful winter pond has come about through intelligent practical experiments, and no less intelligent and affectionate interest in the plants themselves. The expense of changes in piping, etc., has added considerably to the cost of these frames as they now stand, but Mr. McElvery estimates that with the digging, bricklaying and cementing done by home-labor, the entire cost for frames of similar size need not exceed \$125.00. This includes the walls, piping, sash and boiler. A ton of nut-coal lasts over two months, and a water-garden on the south or south-west side of a greenhouse, with connecting pipes from the greenhouse, could be run at even less cost for fuel than is this separate plant.

Altogether, this is a most instructive experiment, and it shows how much can be done with a small expenditure of money by one who really loves flowers. Mr. McElvery has proved that it is just as easy to have choice Water-lilies in the winter-time as any other flowers, and that they can be grown quite as cheaply as any of the ordinary inhabitants of the greenhouse. Indeed, they are grown at even less outlay, after the first cost of the pond, than, perhaps, any other class of flowering plants, and they practically take care of themselves, the main work connected with their cultivation being to get rid of the surplus plants. Mr. McElvery would doubtless give further details relating to the arrangement of his tanks and cultural directions to any one interested in the subject.

Brooklyn, N. Y.

M. B. C.

Recent Publications.

Timber-trees, Native and Foreign. By the late Thomas Laslett. Second edition, completely revised, with numerous additions and illustrations, by H. Marshall Ward, Professor of Botany in the Royal Indian Engineering College, Cooper's Hall. Macmillan & Co., London and New York. 1894.

A number of trees in North America are popularly called Pitch Pines, a common appellation in this country for all the species with two or three leaves in a sheath, thick ridged bark and coarse resinous wood. The Pitch Pine of New England and of the middle states on the Atlantic seaboard is *Pinus rigida*, a common species at the north, but in the south only found on some of the foot-hills of the

Appalachian Mountains, reaching the extreme southern limits of its range in northern Georgia. The wood of this tree, except for fuel, has little value, although at the time of the first settlement of the mountainous parts of the middle states, and before railroads made the transportation of timber from one part of the country to another possible, the trunks were sometimes hewn into sills and beams for houses. In the first edition of Mr. Laslett's work we are told that this tree is found spread over a wide tract of country between the Penobscot and Mississippi rivers and that the wood is chiefly employed in shipbuilding. The wood is carefully described, and tables showing the results of experiments undertaken to test its strength are published. We are told, too, that the southern states produce the best spars for masts, timber and plank, and that these are shipped to England from the ports of Savannah, Darien and Pensacola. In the present edition this chapter is reprinted without change, except that the editor tells us that *Pinus rigida* must be distinguished from the very different *Pinus australis*, called Pitch Pine in the southern states.

It is impossible to know, of course, whether the tables relate to experiments made on the wood of *Pinus rigida* or of *Pinus australis*; presumably, however, they relate to the last species, for the wood of *Pinus rigida* probably rarely reaches England, all the American pitch pine used in Europe being the wood of *Pinus palustris*, of which *Pinus australis* is a synonym. This confusion in the minds of Europeans with regard to these two trees, one the most valuable of all Pine-trees, and the other one of the least valuable, is of ancient date, and year after year European silviculturists import quantities of seeds of *Pinus rigida* in the belief that they are to produce the trees that yield the American pitch pine of commerce. Errors of this kind die hard, but it was not to have been expected that such a palpable one which has been exposed over and over again in standard American publications would be perpetuated in a work of such scientific pretensions as this.

Timber and Timber-trees deals primarily with timbers of the British colonies, although this hardly seems the reason for dismissing *Pinus palustris*, one of the most valuable timber-trees of the world, with half a dozen lines; but this short paragraph enables the editor to insist, after having mixed up this species with *Pinus rigida*, that "it must be distinguished from the northern *Pinus rigida*, etc., which is exported under the same name." Nor does it seem possible that any work upon timbers could have been written in these days without some allusion to the California Redwood, or to the Port Orford Cedar of Oregon, or to those most valuable Japanese woods produced by two species of *Chamæcypris* and by *Zelkowa Keaki*. It seems strange, with our ideas of botanical geography, to read of *Picea Engelmanni* as an inhabitant of Canada and the northern states, although this Rocky Mountain species does reach in a comparatively depauperate form some of the mountain ranges of British Columbia.

Americans who have seen the great Live Oaks of the south Atlantic coast region, with trunks six to eight feet in diameter and immense limbs shooting out for a distance of fifty or sixty feet, will be surprised to find this tree described in a scientific work as a tree "of very moderate dimensions when compared with the White Oak, its usual height being only about thirty-five to forty-five feet, with a diameter of twelve to eighteen inches." No specimens of this wood could be obtained in England large enough for testing, but Mr. Laslett judged from its appearance that it was stronger than that of any other known Oak, although in reality the wood of eight other species of North American Oaks is stronger. This has already been published more than once; but, curiously enough, Professor Ward appears to have overlooked the fact that the Government of the United States instituted fifteen years ago a comprehensive series of tests to determine the value of the wood of every North American tree, and that the results of these tests were printed in elaborate tables in the ninth volume

of the Final Reports of the Tenth Census of the United States.

The value of *Timber and Timber-trees*, in its second edition, is greatly enhanced by Professor Ward's introduction, in which he discusses the nature of timber, with the different ways of looking at it by different classes of individuals, such as timber merchants, engineers and builders, carpenters, chemists, physicists, botanists, foresters, etc., and he has recast and brought down to date the chapters on the growth and structure of trees, on their diseases, and on the seasoning and preservation of timbers; and it is to be regretted that that portion of the work devoted to the specific account of the different timber-trees of the world and their products has not been also brought up to the existing state of our knowledge of the subject.

Notes.

The people of Baltimore have decided by vote to invest a million dollars in another park. The ground selected is well known as Clifton, the splendid estate of the late Johns Hopkins, and one of the many beautiful country homes that lie on the outskirts of the city. The money for this park has been accumulating for twenty-five years from annual taxes on the gross revenue of the street-railway companies.

A new Peach called the Triumph, and originated in Georgia by Mr. J. D. Husted, is a freestone variety, which ripens as early as the Alexander and other clingstones. Charles Downing said that a freestone peach as large, early, handsome and as good in quality as the Alexander would be worth millions of dollars. Mr. J. H. Hale, who usually speaks with caution, states his belief that the Triumph has all these good qualities.

The report of the legislative committee which was appointed to investigate the charges of fraud in the administration of the Minnesota Pine-lands seems to have discovered a great many abuses, and it is believed that the state will be able to collect many thousands of dollars as the result of their labors. It is plain that immense amounts of timber have been dishonestly taken and sold, and it is charged that the Hinckley forest-fires, which destroyed more than five hundred lives and millions of dollars' worth of timber, were set by stumpage-thieves to cover up their stealings of timber in the state lands.

The Dutchess County Horticultural Society was organized at Poughkeepsie on the second of January, with the following officers: President, James Blair, gardener to Ogden Mills; Vice-President, M. J. Lynch, Poughkeepsie; Treasurer, James Sloan, Poughkeepsie; Secretary, Wallace Gomersell, gardener to Winthrop Sargent, Fishkill-on-Hudson. It is creditable to the gardeners and florists of that section that they have formed such a society, and it is to be hoped that they will have abundant coöperation and sympathy, especially from the landed proprietors in this favored region. There ought to be many true friends of horticulture in Dutchess County outside of the ranks of those who have made it the business of their lives.

In a bulletin recently published by Professor E. W. Hilgard, of the University of California, it is stated that the Australian Salt Bush, *Atriplex semibaccatum*, can be grown as successfully on the alkali lands of the San Joaquin valley and elsewhere in that state as a forage-plant. Where the percentage of alkali in the soil is very high this can be materially reduced by planting the Salt Bush and removing each cutting from the land. The yield is double that of either Oats, Barley or Wheat hay and as much as that of Alfalfa, while its composition outside of the Ash makes it an excellent stock-food, and it seems to be readily eaten by them. It is not definitely known whether the large amount of saline ingredients would be harmless to milch cows. Certainly they would not need any salt, and if no purgative effects follow the eating of the plant no other disadvantages need be apprehended.

The *Bushberg Catalogue*, which we have again received, is something more than a mere catalogue. Its full description of the various kinds of Grapes cultivated in this country, makes it very useful and convenient for reference, but the chapters which precede this list also have a genuine and permanent value. The notes on the classification of true Grapevines by Dr. George Engelmann, the viticultural observations on our native species by T. V. Munson, the chapter on fungous diseases of the Grape and their treatment by Professor B. T. Gallopay, the account of insects injurious to the vine, as well as

those which are beneficial, by Professor C. V. Riley—all these are the work of recognized experts, and besides these there are practical notes on climate, soil, planting, cultivating, grafting, training, packing, wine-making, etc., which are instructive and helpful, so that the book can be commended as a useful one to all those who grow grapes for market or for home use. It is issued by Bush & Son & Meissner, Bushberg, Missouri, at the price of fifty cents.

Now that a growing interest is manifest in the subject of nut-culture, Dr. Hoskins observes that too little is said about the Butternut, especially for growing in the cold north. In quality the meat of the butternut is rich, and, to some people, it is more agreeable than that of the English walnut, but its rough outside is not attractive and its shell is hard. We never heard of any attempt at growing select varieties, although the wild trees differ very much in the quality of their nuts. Perhaps some varieties of value could be secured by crossing our native Butternuts with the foreign species, and a seedling Butternut will bear when it is quite young. Dr. Hoskins planted a few butternuts in rows sixteen years ago, and the trees from this seed have been bearing good nuts for several years, and he finds that the best varieties can readily be grafted on trees bearing inferior nuts. The whole business is simple, and Dr. Hoskins has proved that growing butternuts will pay, at least as well as growing apples.

In an excellent paper on the Ventilation of Glass Houses, read before the Society of Minnesota Florists, Mr. Lewis Wilde argued against the common error of considering ventilation nothing more than an easy means of regulating temperature. He explains how the change of the exhausted air of the houses for the purer outside air supplies carbonic acid gas, to be taken up by the leaves of plants, and especially how ventilation regulates the moisture in the air which indirectly influences the growing process of plants. When the air in a house is completely saturated with moisture no transpiration from the leaves can take place, and, therefore, no water containing diluted food is taken up by the roots, and consequently the plants will grow feeble or die. This is the danger in cool weather when the houses have been watered and syringed without ventilation. When the ventilators are open, the moisture-laden air is replaced by the drier air from without, the leaves at once begin to evaporate moisture and root-action and nutrition goes on in a normal way. The fact that as the air grows warmer it is capable of taking up more vapor furnishes a probable reason for the check of Roses under glass in the autumn and spring when there is no fire-heat. During the day the temperature will rise high and it will sink correspondingly during the night and early morning. In the daytime a large quantity of vapor is taken up, enough to completely saturate the air when it cools down at night, and the Rose-leaves, not being able to evaporate any moisture, will suffer a check as soon as the rays of sun fall on them. In order to prevent this, fresh air should be given during the night with fire-heat when the temperature does not fall below sixty degrees.

Florida oranges, which have been wholesaling at about \$2.00 a box, have advanced to \$4.00 and \$5.00, with a prospect of a still further advance for good fruit, if any can be secured. The cold wave which visited Florida in the last days of December was the most disastrous known in the history of that state. Ice formed an inch thick as far south as Lake Worth, and in many other sheltered places where Orange-groves had heretofore been safe, the fruit was frozen solid on the trees. The loss to the fruit-growers, as well as the merchants, transportation companies, the packers and all those in any way connected with what promised to be a most profitable season, has been almost as serious as if the state had been swept over by fire. Owing to the drought of last summer the Orange-trees bloomed late in the fall, and there was promise of a large crop of late fruit. Of course, this is all destroyed, and the fruit-buds for next year's bloom are probably ruined. Many young orchards are killed, and many of the old trees will be cut back seriously. The salable oranges now arriving in this city are those which had been picked and were in packing-houses before the cold wave. Some oranges which were caught by the frost in transit bring little or nothing. Grape-fruit now sells at \$6.00 a box at wholesale, and the price is steadily advancing. To meet the deficiency caused by the disaster in Florida, large orders have been cabled for Messina and Palermo oranges, and Sicilian fruit now here is commanding high prices. Oranges are already selling in the groves in California at an advance of \$1.50 a box. Apples and other fruit have not yet felt the effects of the scarcity of oranges, but all kinds of winter fruit will probably be dearer as they are called upon to supply the deficiency.

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLE:—A Novel School of Horticulture.....	21
Notes on the Tree Flora of the Chiricahua Mountains.—II. (With figures.)	22
An Indian on Indian Corn.....	T. W. Tournay, M.D. 23
FOREIGN CORRESPONDENCE:—London Letter.....	W. Watson. 23
PLANT NOTES	23
CULTURAL DEPARTMENT:—Notes on Carnations.....	W. N. Craig, T. D. Hatfield. 26
Gloxinias.....	William Scott. 27
Mushrooms.....	W. Downs. 27
CORRESPONDENCE:—Variety versus Monotony.....	W. Watson. 28
Salix balsamifera.....	Merritt Lyndon Fernald. 28
Apple-scab in Nebraska.....	Fred W. Card. 28
The Forage Problem in Iowa.....	Professor L. H. Pammel. 28
RECENT PUBLICATIONS	29
NOTES	31
ILLUSTRATIONS:— <i>Pinus Chihuahuana</i> , Fig. 3.....	24
<i>Pinus latifolia</i> , Fig. 4.....	25

A Novel School of Horticulture.

DURING its session of 1894, the Legislature of the State of New York passed what was known as the Experiment Station Extension Bill, which, among other provisions, appropriated \$8,000 to be expended in the western counties of New York; under the direction of Cornell University, for the benefit of horticulture. The fund was to be used in conducting experiments and investigations, in studying plant-diseases and the most profitable ways of fertilizing vineyards, fruit-orchards and gardens, and in publishing the results of such investigations and in disseminating horticultural knowledge by means of lectures and otherwise. Early in December we received a conspectus of a School of Horticulture, to be held in Chautauqua County on the last week of the year during four days and to be conducted by Professor L. H. Bailey, in accordance with the provisions of the act we have quoted above.

The programme, as announced, looked attractive. It seemed that this school of horticulture was the very natural and satisfactory development of the Farmers' Institutes which are held in various parts of the country now, and many of which have become specialized so as to take up a single branch of agriculture like dairy husbandry, fruit-culture or the like. The most noteworthy fact brought out in the announcement was, that although this institute was to be held in one of the famous grape-growing regions of the state, small promise of instruction was offered in what might be called the practical and every-day working details of horticulture or viticulture. Only one afternoon was to be occupied in any matter of manual skill, and this time, devoted to general nursery practice, was given largely to a discussion of principles rather than of methods. The course was confined almost exclusively to the fundamental principles of horticultural science. Thus, the subject of the first half-day's session was How Plants Live and Grow, accompanied by demonstrations with the microscope by Professor Rowlee. Another half-day's topic was a brief on the Evolution of Plants, with the Origin of Varieties. One session was devoted to the Geological History of Soils, with stereopticon views; another to the Chemistry of the Grape and of the Soil; another to the theory of tillage and the productivity of land; another to the subject of

Fungi, with stereopticon views. This tendency toward strict science is something like an innovation on the ordinary Farmers' Institute work, but, plainly, it was the proper course to pursue, and it promised to furnish the students with what was really the most practical kind of information which could be given them within the period named. Another interesting point was that each session was to begin with lessons in observation. At one session the subject to be studied was twigs, at another fruit-buds, and again seeds, leaves, flowers, fruits, and last of all, the apple. This also appeared to us to be a feature full of pleasing promise, and we have, therefore, made some inquiries of persons who attended the school, both in the capacity of instructors and as students, to ascertain whether the venture had proved satisfactory.

From the letters received we learn that sixty persons registered as students, and nearly all of them answered to the roll-call at every session. These students were all practical horticulturists, most of them grape-growers in the famous Chautauqua valley; among them were two or three physicians, a clergyman and others who had adopted the pursuit of horticulture either as a business or a diversion. The interest increased as the sessions went on, and nearly all the students took notes upon the lectures and passed satisfactory examinations on them afterward. Perhaps this is the first school or institute of the kind which was ever held in this country, and it seems to have been unqualifiedly successful. The observation-lessons were remarkably stimulating, and it was surprising to see what interest even the elderly men took in the simplest objects. When twigs of various kinds were passed about the first day, ten minutes for observation were allowed, and then the various members of the class were asked what they had seen. As the subject of phyllotaxy, or the arrangement of buds on the stem, had not been studied by many of them, the class became almost excited as the mathematical ratios developed by the arrangement were brought out. This experience was repeated at every session, for there was not a single observation-lesson in which the discovery of some equally striking law or truth was not made by carefully studying the most familiar objects which had been before their eyes every day of their lives. Perhaps the most interesting lesson of all was the very last one, when, after the flowers had been studied, the structure of the apple was taken up. As the meaning of the various parts of the fruit was revealed, and their relations to the parts of the flowers became evident, the wonder of many members of the class at what was novel information to them was very manifest.

Of course, it is not to be expected that accomplished horticulturists will be graduated from a school like this after four days of instruction, but whenever a man learns new fundamental scientific truth he becomes to this extent more intelligent in the practice which rests upon this truth. Certainly a man will cultivate his land more efficiently after he has listened to the explanation of Professor Roberts, who showed in what way tillage promoted capillarity of the soil and how it brought fertility to the plant, set free mineral nutrients, hastened nitrification, presented new surfaces to rootlets, conserved moisture, and did much more besides. With some knowledge of these fundamental principles any horticulturist would be better able to judge when to cultivate and how to cultivate. It is not to be assumed that Professor Caldwell in his lectures on the chemistry of the soil and of the grape made expert analysts of any of the Chautauquans, or that in a single afternoon Professor Rowlee made plain to his hearers all the intricate processes in the nutrition of plants. Nevertheless, on these and other subjects alert, level-headed men and women familiar with all the phenomena of plant-growth will very readily seize upon some fundamental scientific principles which will aid them very materially in their every-day work. Not only will new ideas throw new light on the reasons for their practice, but it will lead them to inquire for more knowledge as they attempt to adjust their practice to their new-found

knowledge, and, more than that, the substantial and indisputable truths here acquired will probably avail to keep them from many costly mistakes by showing them the impracticability of projects which to the utterly uninstructed might seem promising.

We are glad that the first horticultural institute of this sort has been held under such favorable auspices. We consider it a step forward in the means and methods of popular instruction. A little knowledge is not a dangerous thing when it is rudimentary and fundamental knowledge. The dangerous kind referred to by the poet is a superficial smattering.

Notes on the Tree Flora of the Chiricahua Mountains.—II.

ASCENDING the cañon, on the mountains at either side, were large areas of Scrub Oak, including *Quercus undulata*, *Q. hypoleuca* and *Q. chrysolepis vaccinifolia*. Two other Oaks, *Q. Gambelii* and *Q. reticulata*, were found farther up among the Pines and Cypress. *Quercus Gambelii* is known as Pin Oak, and, although here a small shrub, produces a trunk eighteen inches or two feet in diameter farther north. *Q. reticulata* is also generally a shrub, but in moist places in deep cañons it not infrequently approaches a tree in size and habit. This species, although very near *Q. grisea* in specific characters, is quite different in general appearance. The bark is much smoother, the foliage a deeper green, and the cups, with their long peduncles, remain on the branches several months after the acorns have fallen. In July the peduncles of the former year were still on the branches. An Oak was found at old Camp Rucker which has been referred to *Q. grisea*, but which has the general aspect of *Q. oblongifolia*. It has the same bluish cast to the leaves, and but little roughness on the under surface. The peduncles are long, something like those of *Q. reticulata*. By examining the acorns of these three species it will be seen that they are almost identical. They are very astringent, and the cotyledons are a deep purple color.

Yucca macrocarpa was found in abundance throughout the south and central portions of this range. It is strictly a mountain plant, frequent in shady cañons at an elevation of from three to six thousand feet. This species seldom gets beyond the foot-hills, and is in full bloom by the 20th of July and ripens its fruit by the 10th of September. *Y. baccata* is a more northern plant, but covers large areas on the east slope of the Chiricahua Mountains between Gayleyville and Fort Bowie. Its habit of growth is entirely different from *Y. macrocarpa*. The caudex, if at all long, lies prostrate on the ground, while *Y. macrocarpa* is always upright. *Yucca elata*, the most widespread *Yucca* of Arizona, is frequent on the mesa at either side of this range. It is a plains plant, and never found in the mountains. It reaches its maximum size in south central Arizona, and is in full bloom by the first of June, and ripens its fruit a month or six weeks later. The *Yucca* of the Colorado plateau, which has been referred to this species, is quite different, and should, I believe, be considered a new species.

Two arborescent species of Cacti—namely, *Opuntia arborescens* and *O. fulgida*—are frequent in the valley west of the mountains. Both of these species form small trees, with trunks sometimes eight or ten inches in diameter.

A few miles below old Camp Rucker the first Pines were observed, and from here they increased in size and frequency almost to the summit. The first species observed were *Pinus cembroides* and *P. Chihuahuana** (see page 24). Several miles above the old camp were many large speci-

mens of *P. latifolia*† (see page 25) and *P. ponderosa*. I am inclined to the opinion that all the long-leaved, broken-cone Pines of southern Arizona are at most only varieties of *Pinus ponderosa*. There seems to be all variations, from the long-leaved to the short-leaved forms.

Abies concolor, *Pseudotsuga taxifolia* and *Cupressus Arizonica* were not infrequent in the cañons above five thousand feet. The Arizona Cypress is a rare tree, only growing in a few of the mountain ranges of the territory. The largest specimens observed here were eighteen inches in diameter and fifty feet high. There is a large grove containing many thousand of these trees at the Natural Bridge in central Arizona. They are very symmetrical, and many of them fully three feet in diameter. The bark has a reddish cast and peels off in long shreds. This character, however, was not observed in the specimens seen in the Chiricahua Mountains.

I much regret that I was unable to get to the highest point of these mountains, as there are probably trees growing there which are not in the following list. I was informed by a Mr. McGraw, a ranchman thoroughly familiar with the mountains, that a White Pine and a Larch were growing at the summit. It is not improbable that a White Pine, probably *Pinus reflexa*, does grow there, as it is found in many of the other ranges of southern Arizona. I seriously question the possibility of finding a Tamarack there.

In Turkey Creek cañon, which opens toward San Simon Valley, just south of Fort Bowie, were fine specimens of *Acer barbatum grandidentatum*, *A. Negundo* and *Prunus serotina*. This latter species shows a great variation in the size and flavor of the fruit. The trees in this cañon were especially noticeable for their large fruits, with comparatively small pits. It is not impossible that this species might be made of considerable horticultural importance.

Cercocarpus parvifolius paucidentatus and *Rhamnus Purshiana tomentella* are frequent throughout the entire range. The former appears very different from *Cercocarpus parvifolius*, and very likely is specifically distinct. Large areas of San Simon Valley are covered with a stunted growth of *Prosopis juliflora* and *Koeberlinia spinosa*. The spines of the latter species are said to be poisonous, and produce a stinging sensation when they pierce the skin.

I append a list of the trees collected in the Chiricahua Mountains and in the adjacent valleys. Of course, it is understood that a large percentage of this list were observed in several of the ranges visited. It is quite remarkable that this one range in the very south-eastern portion of Arizona has over fifty species of trees, or more than one-ninth of the total number in the United States :

Condalia obovata, *Koeberlinia spinosa*, *Rhamnus Purshiana*, *Rhamnus Purshiana tomentella*, *Acer barbatum grandidentatum*, *A. Negundo*, *Sapindus marginatus*, *Acacia Berlandieri*, *A. Greggii*, *Robinia Neo-Mexicana*, *Prosopis juliflora*, *Parkinsonia Torreyana*, *P. microphylla*, *Eysenhardtia orthocarpa*, *Prunus serotina*, *Vauquelinea Californica*, *Cercocarpus parvifolius paucidentatus*, *Cereus giganteus*, *Opuntia arborescens*, *O. fulgida*, *Sambucus Mexicana*, *Arbutus Arizonica*, *Bumelia spinosa*, *Fraxinus velutina*, *Chilopsis saligna*, *Celtis Mississippensis reticulata*, *Morus celtidifolia*, *Platanus Wrightii*, *Juglans rupestris*, *Quercus Gambelii*, *Q. undulata* (several widely varying forms), *Q. oblongefolia*, *Q. grisea*, *Q. reticulata*, *Q. chrysolepis vaccinifolia*, *Q. Emoryi*, *Q. hypoleuca*, *Q. n. sp.*, *Alnus oblongifolia*, *Salix nigra*, *S. longifolia*, var., *S. sp.*,

* This species, which is well distinguished from all other Pine-trees bearing their leaves in clusters of threes by the deciduous-leaved sheaths, was discovered by Wissler on the mountains of Chihuahua, and first described fifty years ago by Dr. George Engelmann, to whose long and patient studies we are indebted for much exact information on the Pine-trees of western and south-western North America, the great headquarters of the genus. Much later, *Pinus Chihuahuana* was found on several of the mountain ranges of southern New Mexico and Arizona, where, scattered among *Pinus Arizonica*, *Pinus ponderosa* and *Pinus reflexa*, near the upper borders of the Live Oak forests which cover the lower slopes of these mountains, it is a comparatively rare tree, and seldom grows to the height of sixty or seventy feet. The wood is soft and brittle, and *Pinus Chihuahuana*, although it possesses considerable scientific interest, has little economic significance as an inhabitant of our forests.

† In vol. ii. of GARDEN AND FOREST (page 408) this Pine tree, closely related to *Pinus ponderosa*, which had been found by Dr. Henry Mayr, the German forester, some time previously on the Santa Rita Mountains of Arizona, was described and figured. It is distinguished by its very long broad leaves and by the stout recurved umbos of the more or less mammæformed basal cone scales; and in these characters appears very unlike forms of that well-known and very variable tree from more northern regions. There is such resemblance to other forms of *Pinus ponderosa*, however, in the bark, habit and general appearance of this Arizona tree which were not known when Dr. Mayr's specimens were described that it is not improbable, when this western American Yellow Pine group is studied in all its forms, that it will be necessary to include among them the long-leaved Arizona tree, of which there are two or three remarkable varieties. On the Santa Rita, Huachuca and Chiricahua Mountains this tree is not rare at elevations of about seven thousand feet above the sea, where it grows on stony slopes with a short-leaved variety of *Pinus ponderosa* just below the belt of *Pinus cembroides*, which covers, with a rather dense forest, the highest slopes of these mountains.

Populus tremuloides, P. *Fremontii*. *Cupressus Arizonica*, *Juniperus pachyphylcea*, J. *occidentalis monosperma*, J. *Virginiana*, *Pinus reflexa*, P. *cembroides*, P. *Arizonica*, P. *ponderosa*, P. *latifolia*, P. *Chihuahuana*, *Pseudotsuga taxifolia*, *Abies concolor*, *Yucca elata*, Y. *macrocarpa*.

Tucson, Arizona.

J. W. Toumey.

An Indian on Indian Corn.

THE Penobscot tribe of Indians, on the Penobscot River, some three or four miles above the city of Bangor, Maine, has a considerable "reserve," consisting chiefly of some large islands. Some of these Indians are farmers, though most of the men are engaged in lumbering, which is extensively carried on at that point. They have very good schools, and as I have several times taken the up-river train in the morning from Bangor, I have been pleased in observing the well-dressed and intelligent-looking Indian girls and boys who avail themselves of the same train on their way to school. They do not seem in any way inferior to their white companions on the same train, either in the neatness of their apparel or in general good looks.

I have also had an opportunity of becoming personally acquainted with a few of the leading men of the tribe, and with one of these, Mr. Peol Susup, I have corresponded on a number of subjects, one of which was Indian Corn. I had been trying to develop and improve the dwarf and early varieties which are alone suited to the elevated north-eastern portion of Vermont, and in reply to my inquiries Mr. Susup wrote to me as follows :

Indian Corn is called by the Indians Weachin, and it is believed to have originated in Mexico. When white men arrived in America they found it in cultivation from latitude forty degrees south to the island of Orleans, in the St. Lawrence River. That was probably its extreme limit in the north-east. How it could have been propagated and ripened so far north of its native tropical home has been a subject of curious speculation. Every cultivator has doubtless noted how difficult it is to perfect the plant from seed obtained at any considerable distance south of the region in which he endeavors to raise it. Seed procured from New York will seldom or never perfect itself in Maine, and it is deemed unsafe to plant that brought from Massachusetts. How, then, did the Indian, without other agricultural education than that derived from his own unrecorded and imperfect observations, push its production from the Gulf of Mexico to the St. Lawrence? He certainly accomplished this result ages before the white man visited him; and it was to the natives that the early white settlers of New England were indebted for their seed corn of the varieties now in use.

An annual plant may extend itself east, or west, along isothermal lines, by accidental causes; but it could not have moved into a colder climate, requiring cultivation and care, without great attention, and the application of more than ordinary skill. It must have required ages to have been acclimated in that country now constituting Canada and the New England states.

The Indian has a tradition regarding the method by which the northern varieties of Corn were obtained and perfected. Like all the grasses, and many other annual plants, Corn grows upward by joints or sections. The Indians observed that the time required to produce and perfect a joint was one change of the moon; and as the ear of corn starts only from a joint there was necessarily about seven days between the forming of the ears on successive joints. Now, if an ear can be made to start at the second joint, it would mature some five weeks in advance of that which should be formed on the seventh joint. By constantly selecting for seed the lowest ears, he finally obtained varieties that produced from joints lower than the original plant, and very much earlier. Thus, in time, corn was produced, small in stalk and ear, and adapted to the short summers of the north. Slowly, but permanently, it passed into the eight-rowed corn, producing constantly on the lower joints, and ripening in three months from the day of planting.

I may add to Mr. Susup's account an early memory of my boyhood. My grandfather was, in 1792, an emigrant from the valley of the lower Connecticut River, near Windsor, Vermont, to Kennebeck County, Maine. He found it diffi-

cult to obtain at that time any variety of Corn that was safe to grow, even in south-western Maine; but later he supplied himself with a sure-ripening variety called the Canada Creeper, which produced its ears very near the ground. In the elevated region of north-eastern Vermont, where I have now lived for nearly thirty years, I found the same trouble, and surmounted it in the same way; but by careful selection I have greatly increased the length of the ears, and the consequent productiveness, without lessening the earliness of the crop. My annual yield of this corn, when dry and shelled, is rarely as low as fifty bushels an acre.

Newport, Vt.

T. H. Hoskins.

Foreign Correspondence.

London Letter.

ARUNDINARIA MACROSPERMA (*A. tecta*) is a North American Bamboo, which is very much wanted by growers of hardy Bamboos in this country, but at present it cannot be obtained for love or money. None of the American nurserymen catalogue it, and none of the many likely people in America who have been asked to send plants of it have so far responded, until it has been questioned whether this Bamboo is to be found in the United States after all. We have all read of "cane-breaks," and have been informed that they are formed of big stretches of *A. macrospurma*. Is it possible that they have all disappeared? If not, and there are plenty of plants of it to be got for the digging, I would recommend some enterprising nurseryman to advertise the plant at so much per hundred in some English horticultural paper, and, unless I am much mistaken, he will have reason to be glad for this suggestion. We have a clump of it at Kew, where it is perfectly hardy and evergreen, and, consequently, is much coveted by the majority of those who see it here.

RHODODENDRON KEISKEI.—This species was described by Maximowicz in 1870 in a paper published in the *Memoirs of the Academy of Sciences*, of St. Petersburg. Plants of it are in cultivation at Kew, and one of them has lately flowered. In the form and color of the flowers it most resembles *Rhododendron Dauricum*, which flowers in winter, but there is a marked difference between the two in habit and foliage. *R. Keiskei* is dwarf in habit, with trailing branches, biennial, elliptic, ovate, leathery leaves three inches long, green above, clothed with reddish lepidote spots below. The flowers are in loose corymbs of from three to five; calyx lobes nearly obsolete; corolla campanulate, an inch across, colored rose-purple; stamens ten, declinate, the filaments slightly hairy at the base. The plant is quite hardy at Kew, and, judging from Maximowicz's description and figure, it is likely to prove at least as useful as *R. Dauricum*. It is a native of Kyushu and of Hondo, where it is sometimes cultivated in the gardens of Tōkyō.

KNIPHOFIA NATALENSIS.—This species was first described some eight years ago from specimens sent to Kew by Mr. Medley Wood, of Natal. A plant of it from the same source flowered in a cold greenhouse at Kew in June, 1889, the scape in this case being two and a half feet long, bearing a loose spike of drooping orange-yellow flowers an inch long. A short time ago Herr Max Leichtlin sent to Kew a plant which he thought would prove to be a new species. He had received it from Natal. With him it flowered in winter, and had leaves four feet long. It is now in flower at Kew, and while it does not specifically differ from *Kniphofia Natalensis*, it is superior to the type in having the flowers much denser on the spike, and in their color being a uniform citron-yellow. If it should prove to be constant in flowering in midwinter it will prove a useful plant for the conservatory. There are now about thirty species of *Kniphofia*, or double the number known in 1870, when Mr. Baker monographed the genus. The extremes of the genus are represented by the gigantic *K. Nothiae* and *K. aloides* on the one side, and the tiny *K. pallidiflora* and *K. pauciflora* on the other. They are all worth a place in the garden.

HOWARDIA CARACCASANA.—The genus Howardia, or Pogonopus, is nearly allied to *Pinckneya pubens*, the beautiful Rubiaceous tree found wild in Florida and Carolina, but, so far as I know, never yet successfully grown in England, notwithstanding numerous earnest attempts. The Howardia under notice is not, however, so recalcitrant, for it has flowered at Kew several times within the last twenty years, and it is in flower now. It grows to a large size if allowed to, Mr. Howard, the Cinchona expert, after whom it was named by Weddell, having grown a large bush of it in his garden at Tottenham. The plant in flower at Kew now is only eighteen inches high; it has opposite, stalked, light green leaves and terminal loose panicles of tubular pink flowers an inch long, subtended by foliaceous bracts colored rose-pink, with yellowish tips. The genus *Mussænda*, also Rubiaceous, has the same peculiar character, but in that genus all the species have white bracts and comparatively small yellow flowers. The Howardia is a meritorious winter-flowering stove plant. There is a good figure of it in the *Botanical Magazine*, t. 5110 (1859), where it is described as "a very lovely stove-plant with gracefully drooping panicles of flowers, whose beauty is very much increased by the remarkable enlargement of one of the teeth of the calyx into a heart-shaped, petiolated, deep rose-colored, foliaceous lobe." It appears to have been distributed by Messrs. Makoy & Co., of Liège, many years ago under the name of *Pinckneya ionantha*.

DRACÆNA GODSEFFIANA is a stove-plant of exceptionally pleasing and distinct character. It is represented by hundreds of plants in the St. Albans nurseries and will shortly be distributed by Messrs Sander & Co. as a new foliage-plant. I have already called attention to it in GARDEN AND FOREST, but it is good enough to be mentioned again. It is a true Dracæna, not a Cordyline, the correct generic appellation of the plants known in gardens as *D. terminalis*, *D. indivisa*, *D. recurva*, etc., and most resembles the old *D. surculosa*, for which it was at first mistaken. Now that it is in character, however, its distinctness from all other cultivated representatives of this genus is very evident. It has thin wiry stems, branches and suckers freely, and its ovate, elegantly waved leaves are colored glossy green, with numerous large spots of creamy white, suggesting in variegation the leaves of a good variety of *Aucuba Japonica*. It is easily propagated from stem-cuttings or by division, and it grows freely. It is a native of Lagos, whence it was introduced about three years ago.

TEA CULTIVATION.—The monopoly of the tea trade by China has long since been broken down, the tea plant being now cultivated in India, Ceylon, Natal, Mauritius and other countries with more or less success. Its cultivation under glass in England even has been suggested as a profitable undertaking. Russia, hitherto China's best customer for the choicest teas, has lately started tea plantations in Batoum, and, according to a recent consular report to the British Foreign Office, with every prospect of success. Chinese tea-planters have been employed to foster the industry, and in less than ten years the experiment has been productive of such satisfactory results that the Russian Government has set apart 43,000 acres to be turned into

tea plantations. The methods of tea culture in practice in Ceylon, India and China are to be thoroughly studied by a commission sent for the purpose to those countries. The Chinese tea-plant, *Thea chinensis*, now called *Camellia theifera*, is hardy against a wall at Kew and forms a dense shrub six feet high in the temperate house. There is no reason, therefore, why it should not be cultivated with success wherever the Orange, Olive, Pomegranate, Persimmon and such like plants thrive in the open air. I am not aware if tea cultivation is an established industry in the southern



Fig. 3.—*Pinus Chihuahuana*.—See page 22.

United States, but if it is not, the experiment is well worth making. The Indian variety, *T. Assamica*, now called *Camellia theifera*, var. *Assamica*, is not so hardy and thrives best in an almost tropical climate. Tea seeds are easily imported from India or Ceylon and they germinate readily. The Assam variety was thus obtained by Kew and distributed to Mauritius, Jamaica, Natal and other colonies a few years ago, the seeds afterward germinating freely. Cultural directions are easily obtained, but I should say that a good loamy soil, a moderate supply of water, bright,

warm sunshine in summer and a minimum winter temperature of about twenty-five degrees, Fahrenheit, are the conditions most essential to success.

London.

W. Watson.

Plant Notes.

LONICERA STANDISHII AND L. FRAGRANTISSIMA.—We place these two Bush Honeysuckles together because they are both of Asiatic, probably Chinese, origin, and are so closely allied that they may ultimately be classified as varieties of

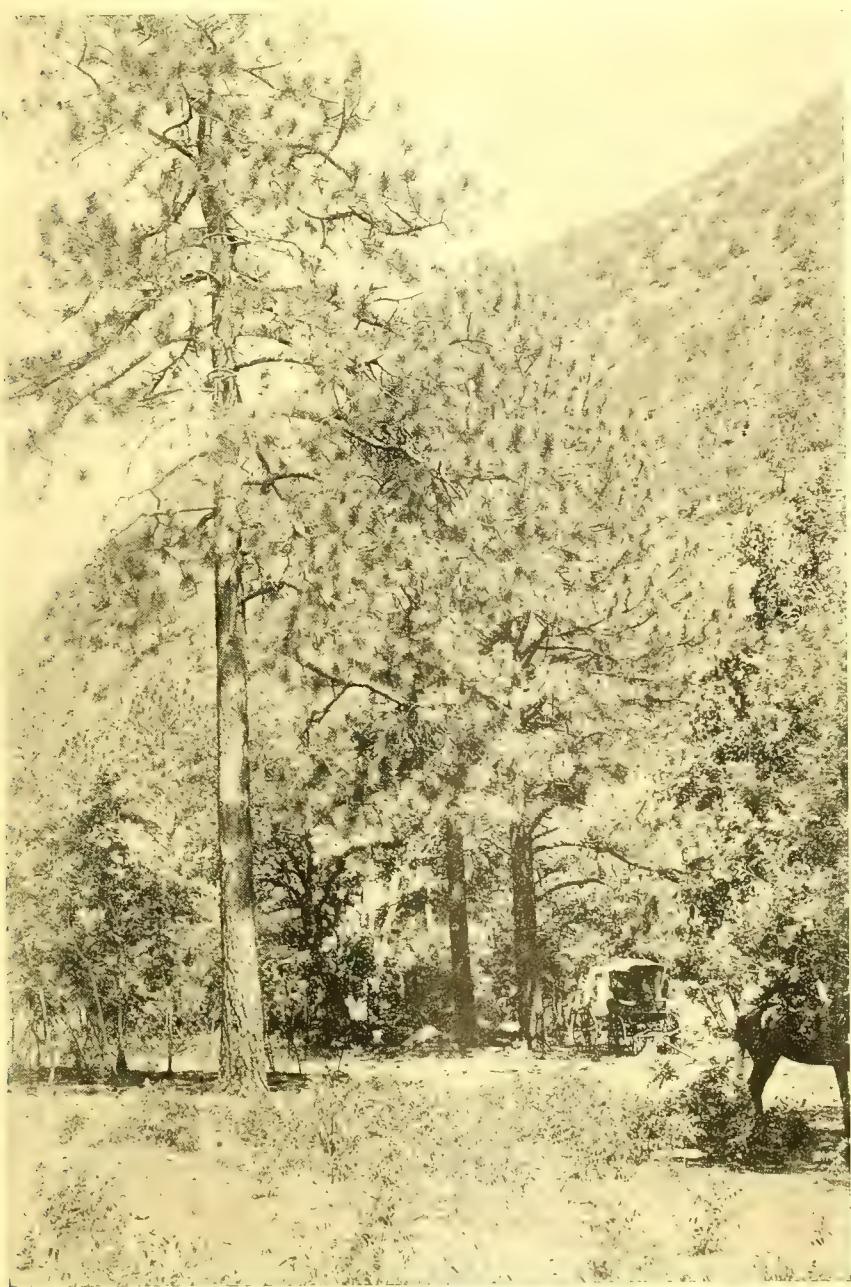


Fig. 4.—*Pinus latifolia*.—See page 22.

a single species. *Lonicera Standishii*, which was introduced into England by Fortune, who found it a common garden-plant in Shanghai, is somewhat the hardier of the two, and its deciduous leaves indicate that it is of more northern origin. Both plants hold their leaves well into the autumn, but *L. fragrantissima* is nearly evergreen in Philadelphia, and, perhaps, entirely so not far south of that latitude. Both species open their flowers very early here, before the appearance of their leaves, and sometimes the flowers appear quite abundantly in autumn before all the

leaves have fallen. Fortune's plant was used quite generously in the original plantations of Central Park, and its white flowers are often seen in warm days in February, while their abundant bloom in April makes this Honeysuckle a feature of the park shrubberies. The flowers of both species are white, although there is a tendency toward rose-color in some individuals of *L. Standishii*. Some of the buds on both plants seem ready to open almost any warm day in winter, and if the twigs are cut off and placed in water in a warm room they will soon fill it with their fragrance, which resembles that of violets. It is noteworthy that this fragrance is quite as marked in the precocious flowers which appear in autumn as in those which wait until their regular season. Both these Honeysuckles are tall, stout-growing, twiggy shrubs with yellow-brown branches. Occasionally, after a mild winter, in which the buds have swelled more than usual, they are blasted by very cold weather in the spring, but there are usually enough remaining to open later and give a fair amount of bloom. In a good season it is not uncommon to find ripe berries among the open flowers in May.

ACACIA PUBESCENS.—We have often spoken of this old plant, which was introduced into cultivation more than a century ago, but it is worth repeating here; that for certain purposes it is one of the very best of this large genus, and a well-grown specimen can hardly be excelled in grace of form. Seedling plants are the strongest. They make roots rapidly, and should be shifted on until the specimens occupy a large tub. When trained to a single stem they will attain the height of about ten feet, and the head will expand into as great a breadth, with drooping branches thickly hung with racemes of small globular sulphur-colored flowers, which appear to the best advantage among the delicate Fern-like foliage. These flowers, too, are delightfully fragrant. The plant is not particular as to soil. After the flowering season, which begins in February and lasts for about six weeks, the branches should be cut back, so that a specimen can be kept within the limit of convenient size for many years, and if the soil is well top-dressed it will always be in first-rate flowering condition. The natural habitat of the plant is southern Australia, and it can be kept in any house where the temperature does not fall below forty. The best treatment for young plants is to plunge them out-of-doors somewhere under a lath shelter, as they prefer a partial shade.

CLEMATIS RECTA.—This is a well-known herbaceous perennial, making a compact plant three or four feet high, and larger still when it has become well established, which

is covered in June with many-branched clusters of small, densely crowded flowers, which are creamy white, and fragrant. Old plants which have remained undisturbed for years are quite effective in a herbaceous border among tall Delphiniums and other plants which flower at this season. It is a native of southern Europe and has been cultivated for its flowers in English gardens for three hundred years. We make mention of it at this time, having recently seen a plant which soon promises to bloom under glass. The roots of the plant, which was a seedling three years old,

was set in a large pot last spring and planted in the border, where it flowered as usual. After some hard freezing it was brought in and slowly started, and it is now a strong-looking plant, grown in a cool temperature and ready to be hurried on to what promises to be a successful blooming. It is doubtful whether the flowers will be worth the trouble of producing them, but they may be useful when cut to arrange with other flowers of strong colors. There are so many plants which can only be flowered under glass in this climate, that it seems hardly worth while to select those which will flower as well or better in the open air if they are only left alone.

Cultural Department.

Notes on Carnations.

IF cuttings of the varieties of Carnations to be grown for summer blooming outdoors have not already been set, no time should be lost in getting them in. Some growers lift old plants from their benches and plant outside, and thus obtain a moderate supply of small early blooms, but the plants are always rather unsightly, and so much finer flowers are produced from cuttings rooted in December or January that old plants are best consigned to the rubbish pile. Comparatively few varieties flower satisfactorily outdoors. Among the white kinds, Mrs. Fisher does well, and easily leads all others for outside culture; Nobsco, as a scarlet, does remarkably well here; Hector blooms very freely, but the flowers burn badly. We have not yet found a thoroughly satisfactory pink variety, William Scott being the best we have tested. Ferdinand Mangold gives a fair supply of crimson flowers. Among yellows, we have not been able to obtain good results from any variety yet tried.

Many Carnations are utterly ruined in the early stages of their existence by being propagated in too strong a bottom-heat; weak, spindling plants are always the results of such propagation. An even bottom-heat of sixty degrees and a top-heat of fifty to fifty-five degrees we consider the best. If a propagating bed with such a temperature is not at command the cuttings will root well in a well-drained box of sand placed on the shelf of an ordinary greenhouse. The cuttings must never be allowed to get at all dry; a sprinkling overhead should be given daily, and a thorough soaking every third or fourth day. With proper care ninety per cent. of the inserted cuttings should take root. Some kinds root much more quickly than others. Mrs. Fisher, Nicholson, Nobsco, Ada Byron and some others are fit to pot or box off in about a month from the time they are inserted, while F. Mangold and some of the yellow varieties require a much longer time.

For winter-blooming plants we consider February early enough to put in cuttings, except of such delicate growers as Lizzie McGowan. In taking a tour round some Carnation establishments of late, we noticed thousands of cuttings rooted in the cutting-benches and quantities boxed off. We found that the growers in every case had raised this stock for sale; their own stock of cuttings would be got in later. Of course, it is perfectly natural for trade-growers to commence propagating as early as possible and sell all the stock they can, but we do not believe that plants grown from cuttings inserted in November, December or the first half of January are as good as those raised later in the season. Allowing that the plants are already rooted and ready to box off, some four months must elapse before they can be planted outside (at least in this section), and whether in pots or boxes, this is far too long a period for the young plants to have their roots cramped. The idea often is that as large plants as possible should be grown by lifting-time in the fall, but medium-sized ones are much better to handle, tie up, and clean, and give furthermore fully as fine blooms and as many of them as the larger ones, in proportion to the space they occupy.

Plants in the benches should now be gone over, untied and cleaned. It pays to do this at least twice in the season. In cleaning them we remove all dead and decaying leaves, and also the weak and spindling growths. These growths are best removed; they give but poor flowers, and their removal gives the remaining shoots a better chance. Care ought to be taken not to tie up the plants too tightly, this spoils many of the young growths. Some growers do not stake or clean their plants at all, and we have seen very good flowers on such plants until spring, when the superiority of those cleaned and staked is apparent to the merest novice. With increasing sunlight the benches will now require rather more frequent waterings, and slightly stronger liquid stimulants can safely be given.

A surface-dressing of wood ashes or some chemical fertilizer, alternated with a watering of liquid-manure or sulphate of ammonia of moderate strength, every ten days or fortnight, will be found very helpful. If good flowers are desired, disbudding should be practiced. This may not be a profitable thing for trade-growers, but it pays in a private establishment where quality is the first requisite. The operation ought to be performed as soon as the buds can be handled.

Among pink Carnations this season William Scott takes the lead; it gives twice as many flowers as any other pink variety, and seems destined to entirely supersede that worthy old favorite, Grace Wilder. This variety has a good stem and good-sized flower, with a strong calyx; its lack of odor is its only drawback. Madame Diaz Albertini has a remarkably strong stem, the stoutest of any pink-flowering sort we have grown. Its flowers are of large size and of a delicate flesh-pink color, with a strong calyx and a delightful odor. The flowers hold well on the plants, which, however, do not bloom so freely as some other kinds. Nicholson gives us the largest flowers of any pink variety; its bright color and fragrance have made it very popular in the Boston market; it needs a stronger stem, however. Ada Byron has the finest odor of any Carnation we grow; the flower is of good size and beautifully fringed; the plant is of a very vigorous growth, but is a poor winter bloomer. Daybreak still retains its great popularity; with some it rusts badly, but with others it is this season doing remarkably well. Among scarlets, Hector is still the best we have; Portia produces more flowers, but they are not over half the size of the other variety. The Stuart has the ideal stem for a Carnation, and is of a good scarlet shade; it is not so good a flower as Hector, however, and blooms less freely. F. Mangold still holds the lead among crimsons. Lizzie McGowan proves itself the most reliable white; it does not produce so many flowers as Mrs. Fisher, but they are of a purer white color; its stem is better, and it seldom bursts the calyx. Helen Keller seems destined to be a very popular kind, but the plants make rather poor growth; it is the best fancy kind at present on the market. Bouton d'Or, from what we have seen of it, is likely to prove a very popular yellow; the flower is of good size, deep canary-yellow in color, slightly flaked and bordered with carmine; it makes good growth, has a strong calyx, and is, so far, perfectly healthy. Goldfinch, one of Mr. Dorner's introductions, is also a fairly good yellow, which blooms freely; the flowers, however, are much smaller than those of Bouton d'Or, and it is hardly worth growing where the other kind will succeed.

W. N. Craig.

CARNATIONS generally, in the neighborhood of Boston, never looked better, and the prospects are that growers hereabouts will make a first-rate display at the forthcoming exhibition of the Carnation Society in Boston next February. Mr. Nicholson, of Framingham, has his William Nicholson and Ada Byron in excellent condition, and they fully maintain in the market and everywhere the reputation they made last season. Some very promising new varieties are also on trial. Mr. Fisher and Mr. Nicholson will show some new scarlets, whites and crimsons, now under number; Mr. Tailby, some yellows, notably Henrietta Sargent, a good pink and a white. The Messrs. Jaune Brothers, of New Bedford, and Mr. Denys Zirngiebel, of Needham, have some fancy varieties which they expect will win favor.

Some rust showed in one or two places this season, but is disappearing with the lengthening days. With regard to this disease, growers agree that cleanliness is the best prevention and remedy. All admit the efficacy of sulphur compounds, and use them, but experience proves that when once the plants are badly affected this treatment is of little apparent benefit. In a visit to a number of growers of Carnations, I found the disease to be worst where the plants were wettest. It is natural to suppose that a lack of root-action and the consequent lessened elimination of moisture will encourage the spread of disease. One grower attributed the poor condition of his plants to overwatering, I, myself, should add, overfeeding, in the earlier stages. The finest plants I have seen have not yet had any stimulants, but with increased sun-power some fertilizers will be given. The best success is had with plants which are kept dry rather than wet, but it is evident that where the root-action is good the plants will quickly become dry.

On the question of soils there is one opinion, and that is, that light soils are best for nearly all varieties. Lime is essential in some form. It is an ingredient of nearly all soils, and thus it is only especially necessary to apply it on heavy soils, and it is generally found in sufficient quantity in all barnyard manures. I was surprised to learn, however, that one grower had failed with William Scott, which almost everywhere has

proved the best pink Carnation. As a reason it was stated that his soil is heavy. This same grower is now taking the best Daybreaks and Ferdinand Mangolds into the Boston market, which would indicate, as has generally proved the case elsewhere, that heavy soils are better for some varieties than for others. Still, it is surprising with regard to William Scott, introduced by Dorner, whose soil, I am informed, is heavy, and that few of his introductions succeed elsewhere on that account.

Mrs. Fisher is still the best all-round white variety, and the most profitable, being also an excellent summer variety. This variety is not grown extensively beyond the limits of the Boston trade. Lizzie McGowan is considered the best white about New York. The difference in choice lies more in the methods of cultivation than in any other particular. If Lizzie McGowan flowered for a longer season, no variety could be more profitably grown, according to New York florists. It is a rather slender, "grassy" grower, and does not take up as much room as Mrs. Fisher, and it may be planted earlier. It needs to be propagated and planted earlier for best results. Tidal Wave is a popular market variety of a deep rose shade, and, although discarded for a time in favor of some of the newer introductions, which it was supposed would supersede it, it is now again coming into favor. It is an abundant producer, but lacks a good stem. E. G. Hill has gradually grown in favor. It is a good clear scarlet of medium size and graceful outline. The stems are long and stout, and the flowers bear few side buds, an important qualification of a good Carnation. In size of flowers, vigor and abundance of crop it does not come up to Hector; some proportion of the latter, however, burst the calyx, a serious defect. Daybreak has become a popular Carnation, and justly so. The color is an attractive shrimp-pink, its flowers extra-large, with stems two feet long. When introduced three years ago it showed a decided tendency to rust, and was not considered as promising as it has since proved. It is looking well everywhere, and carries an abundant crop. Nicholson is another magnificent light pink of different shade, with a tinge of salmon. Ada Byron has not given general satisfaction with the majority of growers, but with the introducer it is a wonderful variety, and, without doubt, the most beautiful in form and the most fragrant of all Carnations. Ferdinand Mangold is still the best crimson.

Uncle John, the Stuart and Jacqueminot are not favorites now, but it is to be hoped the introducers will vindicate themselves at the forthcoming exhibition.

Wellesley, Mass.

T. D. Hatfield.

Gloxiniyas.

THIS is a suitable time to sow seed for a crop of these beautiful flowers. Well-drained seed-pans are required, with a mixture of equal parts of loam, leaf-mold and sand, that on the surface being finely sifted. The pan should be stood in water until the soil is thoroughly wet through, and the seed sown on the surface and left uncovered. A pane of glass should be placed over the pan, and over this a sheet of brown paper, the latter being removed after the seeds have started. As the seeds are very fine, the pans should never be watered from the surface. It is preferable to dip the pan, and to have the water soak up from the bottom until it begins to appear on the surface. A warm moist atmosphere is most favorable to germination. When the plants are large enough to handle they should be pricked into boxes containing the same mixture of soil as before, and finally planted into pots with a little dried cow or sheep manure added to the mixture. They should be kept growing as freely as possible, and all flowers pinched off as they appear, except, perhaps, one on each plant to show the variety, so that those not worth growing may be discarded. In the fall they should be ripened off gradually, and the tubers stored away in a dry place in a temperature not exceeding fifty degrees. Toward the end of December they will show signs of starting, and should be planted in boxes in a mixture of sand and leaf-mold and sprinkled lightly until their growth is well begun, when they should be potted singly into small pots at first, and shifted on as they require it. The potting compost should be as open as possible, the pots well drained, and water should be given carefully. The secret of success lies in keeping the soil sweet and free from stagnation. It is not advisable to sprinkle the foliage, since the leaf, being downy, retains the moisture too long. This is the main cause of rust, to which these plants are subject. Gloxinias should be kept in a light position near the glass, but they are benefited by a slight shading from strong sunlight. A temperature of sixty degrees should be maintained by night, with

a rise of ten degrees by sun-heat, and fresh air should be admitted at every favorable opportunity. Much can be done toward the improvement of varieties by careful selection and hybridization. We raise a batch from seed every year, and get the best results from the tubers the second year, and, with the exception of a few of the finest varieties, we seldom keep them longer than two years.

Tarrytown, N. Y.

William Scott.

Mushrooms.

WE often hear of failures in the cultivation of this vegetable, and among the main causes are (1) that the spawn is not good, (2) that the droppings were not in the right condition, and (3) that the bed has been kept too dry or too wet. It is of the first importance that the spawn be fresh. If it has been kept in a store for a long time it is likely to have thick white fibres running through it; these show that it has at some time been kept warm and started to run, which should not occur until it is in the bed. If, on the other hand, it has fine tissues of fibre all through it, it is in the right condition. Another guide as to freshness is that fresh spawn is not hard and that it has a fresh odor.

Two methods are generally followed in preparing the droppings for the bed. These are drying by exposure and drying by heating. I prefer the latter method for the reason that the main object in drying them is to obtain a gentle, lasting heat, and when they are put through a regular course of heating this brings out the rank heat better than when they are dried by exposure. Have as many droppings as will make the size of bed that is desired, discarding all the long straw that can conveniently be separated from them. They should be thrown into a heap and stand until they get hot and begin to have a whitish appearance on the inside of the heap. They should then be spread out thinly, and they will regain their natural color when they are cooled off. They should be treated in this way two or three times until there is no sign of moisture when they are squeezed in the hand; they will then have a pleasant odor.

The bed should be made from one foot to fifteen inches in depth. A good layer of the droppings should be put in and beaten down until it is firm. One layer after another should be added until the required depth is gained. It is desirable to mix a little sifted loam through the droppings since this keeps the heat down and the spawn runs well in it. A convenient rammer is made of a piece of hard wood five inches square and nine inches long, with a short handle in the middle.

The bed must stand a few days before the spawn can be put in, to let the heat rise and decline, for a bed should be spawned only as the heat declines. On this rise and fall of temperature depends much of the future success, for if the heat rises too high it will just as surely fall too low. I prefer that it should not get much above ninety-five degrees, and the heat is retained much longer if the spawn is put in at eighty-five degrees on the decline. Of course, the closer the pieces of spawn are set the more mushrooms may be expected. About six inches apart each way is a good distance. The spawn should be broken into pieces about two inches square, buried two inches deep, and the bed made firm. The edges of the bricks seldom contain much spawn. About one inch of good loam should be put on the top and firmed down with a spade, and a gentle wetting with tepid water should be given; the water should always be of the same temperature as the bed. If the spawn is dry the bricks should have a gentle watering some hours previous to using them. The bed should have a good covering of hay or similar material, which will retain the moisture as well as the heat. The bed should be watched, and if the hay gets moldy it must be taken out and dried, and if the surface of the bed becomes dry syringing is generally all it will require. If on examination the bed is found dry it should be watered, but drenching must be avoided, as this is injurious. Mushrooms appear in a month to six weeks from spawning, and when they show, a watering of dilute nitrate of soda is beneficial; this causes them to grow quickly and prolongs the season of production. The application of nitrate of soda should be repeated every ten days or two weeks until the bed is spent.

Any place which can be kept dark and near an even temperature of fifty degrees will suit them. A cellar is one of the best places. Mushroom-houses are sometimes placed near the boiler-house; this is radically wrong, causing a dry heat, and making frequent dampings necessary. Mushrooms delight in a moist atmosphere, and well repay attention in this particular.

South Lancaster, Mass.

W. Downs.

Correspondence.

Variety versus Monotony.

To the Editor of GARDEN AND FOREST:

Sir,—The article in the issue of GARDEN AND FOREST for November 28th, signed "M. C. R." is full of suggestion and good advice, but I do not endorse the view put forward that a garden filled with a variety of plants, aptly termed a museum, is a place of weariness in comparison with the garden made up of a few bold groups. The charm of the garden is that it is full of change, and herein it differs from the forest or the park, with its wide breadths of tree or shrub. When I go into a garden I look for interest, not a grand effect merely, not a monotone. In such places as M. C. R. prefers one may walk with enjoyment, but after the first view one's thoughts or conversation are generally of other things than those we see. But in the well arranged garden, rich in its collections of plants, there is a running stream of interest and pleasure as one passes from one object or group to another. I maintain that a garden should be a museum first and a picture afterward. This is also true of parts of the garden, such as border, flower-bed, shrubbery or tree group. A border filled with red roses only may be a grand picture, but it fails to interest as the mixed border does, which we examine from end to end. In large gardens broad effects are easy, but they ought not to be repetitions of the same or a few plants. In the smaller garden these broad effects are not possible, unless one wishes to be thought eccentric. I sometimes walk in Richmond Park, the finest of our metropolitan parks, in which the groves of Oak and Fir that Repton delighted in are a striking feature. There is much pleasure in such a walk, but it does not compare with, is not of the same character as, the pleasure of walking in such a garden as Batsford Park, where there is both breadth and great variety of garden pictures. Variety maintains interest and feeds the mind in a way that monotony cannot do. To compare a garden with a collection of pictures, whether would it be best to have four big pictures on the four walls of one's room or a collection of smaller pictures arranged with proper taste?

London.

W. Watson.

[A picture-gallery exists solely to show each of its individual treasures to the best advantage, and no one thinks that its contents, taken together, should also make a picture or that the paintings which it contains should be grouped or "composed" into larger pictures. Too many persons assume that a garden exists for its individual plants, in the same way that a gallery does for its individual pictures; but there certainly can be an arrangement of the contents of a garden which will give a very complete and satisfying effect, an effect entirely different from that which comes from the enjoyment of the individual flowers or plants. No objection was made by M. C. R. to variety, and no preference was expressed for a few bold groups; a plea for harmony is not an argument for monotony. The title of the article expresses its purpose. It was not aimed against Accumulation, but against Accumulation without Disposition. It is perfectly easy to have a variety of plants and yet to dispose of them so that a consistent purpose will reign throughout, and the garden will not only make a picture, but a new picture, from every point of view. Every one has seen drawing-rooms full of valuable furniture and objects of art which were ugly and wearisome because their contents were unskillfully disposed. A skilled artist might so arrange these objects that the beauty of each would be enhanced by its position and surroundings, while the effect of the whole would be pleasing. It is possible, however, to crowd a place so full of objects beautiful in themselves that no arrangement can save it from a cluttered and depressing appearance, and every one can recall the impression made by some simple room which contained nothing really precious, and yet wore an expression at once of comfort and of grace. A man may ransack the earth for vegetable curiosities and rarities, and fill his garden full of them, and yet it may be a spotty and uninteresting place to look at. It will certainly be such a place if he has been governed by the desire for accumulation alone and gives no thought to the disposition of his material.

After all, it should never be forgotten that there are gar-

dens of every size, and an infinite variety of tastes and habits to be gratified by them. And so long as one really loves his garden and finds health and comfort and delight in caring for it, he is to be congratulated, even if, to the critical eye, its pictorial effect is not satisfying.—ED.]

Salix balsamifera.

To the Editor of GARDEN AND FOREST:

Sir,—It will doubtless interest the readers of GARDEN AND FOREST to know that Salix balsamifera, Barratt, was collected in the White Mountains by the late William Boott. There is a specimen of undoubted *S. balsamifera* in the Boott Herbarium, marked in Mr. Boott's handwriting, "Salix cordata, Lake of the Clouds, Mount Washington, 12th July, 1855."

This plant, then, was collected thirty-two years after its discovery by Mr. Little, and twenty-four prior to its detection by Messrs. Pringle and Faxon.

Botanical Garden, Cambridge, Mass.

Merritt Lyndon Fernal.

Apple-scab in Nebraska.

To the Editor of GARDEN AND FOREST:

Sir,—Last season served to illustrate in a striking way the effect of climate upon fungus depredations. While the Apple-orchards of New York were so overrun by the scab fungus that the crop in many sections was almost a failure, Nebraska was so free from it that in the vicinity of Lincoln scarcely enough could be found to illustrate the effects of the disease on the fruit in lecturing to students. The early part of the season in the eastern states was marked by long-continued wet weather, particularly favorable to the development and spread of fungous diseases. In Nebraska just the reverse conditions prevailed, for the season was an unusually dry one, and at the very time when crops in the east were suffering from too much rain, crops in Nebraska were suffering for the want of it. The chief point aimed at in the spraying experiments at this station was to find whether it would be profitable to cheapen the cost by weakening the mixtures used. It is needless to say that the results were entirely negative, for all were alike useless, and the arsenites alone would have given just as good results. Of course, the present season was unusual, but, to a certain extent, the same conditions prevail every year, and fungi of all kinds are much less abundant here than in the eastern states, consequently the directions for spraying best suited to the east do not apply here. Moreover, some of the enemies which trouble eastern growers have not yet reached us. It should not be inferred from this, however, that we are altogether happy, for in the "blight," "rotten heart," etc., we have enough to occupy our attention. For the present it does not seem advisable to recommend more than two applications of the Bordeaux mixture to Apple-trees in this section, and, indeed, if this season were a fair sample, none at all would be much better.

Lincoln, Neb.

Fred W. Card.

The Forage Problem in Iowa.

To the Editor of GARDEN AND FOREST:

Sir,—The farmers of the north-west, particularly those living west of the Mississippi River, have had some valuable lessons from the dry season of 1894. They have not learned much about weeds or fungi, since diseased plants of all kinds have never been as scarce as during the months of June, July and August, and our annual weeds have suffered quite as much as the perennial grasses in meadows, lawns and pastures, and they will, therefore, be freer from these pests than they have been for many years. The season has been of particular interest, because of the opportunity afforded to study the forage problem. Many forage plants, for example, have been found wanting in their ability to stand long droughts.

The chief forage-plants of the state are Blue Grass, *Poa pratensis*; Clover, *Trifolium pratense*; incidentally also, White Clover, *Trifolium repens*. Indian Corn heretofore in this state has not been used extensively as a forage-plant, but this year it has come into prominence for this purpose. In fact, had it not been for corn, live stock could not have been carried through the months of July and August. This suggests the important fact that the farmers of Iowa have annually been wasting millions of dollars' worth of the fodder which is contained in the Maize crop. It is a well-known fact that the corn-stalk contains about fifty per cent. of the dry matter and over thirty per cent. of the protein of the plant. It is not improb-

able that hereafter Corn-fodder will be saved more largely and used in place of hay.

Blue Grass has shown itself capable of standing, in an unusual degree, the severe drought. In July very little green Blue Grass could be seen. Pastures, meadows and lawns looked bare, but with the rains of August and September they became green, the strong root-stocks of this excellent and nutritious grass spreading in all directions. Timothy has also stood up well, but it afforded less pasture than Blue Grass. Clover made a better growth and gave more hay per acre than any of the old forage-plants. In seasons of this kind it is more valuable to have a mixture of Clover, Timothy and Blue Grass than to grow them separately. The most remarkable feature of these forage-plants, especially Blue Grass, is that although but little remained in pastures, cattle and horses thrived. In other words, the grasses were practically cured in the field, and hence more nutritious than in seasons of great moisture.

Of the little-tried leguminous plants none are more promising in this state than the Cow Pea, *Dolichos Katiang*, var. *Sinensis*, and Soja Bean, *Glycine hispida*, and none are more valuable than the several hardy varieties introduced by Professor Georgeson, of Kansas. Under the most trying circumstances these plants made a large growth, and contained an abundance of fodder. Sweet Clover, *Melilotus alba*, has also been tested, while it made a rapid and good growth. It is not to be recommended because of its weedy nature and the injurious effects which may result from its use. Crimson Clover, *Trifolium incarnatum*, has been a failure. Alfalfa, *Medicago sativa*, on the right kind of soil, is a remarkable drought resister, but it has not been tried extensively.

The Polygonum Sachalinense, which has been commented on so widely as a valuable forage-plant for dry years, made an excellent growth. At no time did it show the wilting effects of the dry weather. I should not advise the extensive planting of this Knot-weed. Its deep-running root-stocks are liable to be a menace in removing it from the field. It may, however, pay to have a few acres.

From these statements it will be seen that the forage problem resolves itself into the use of several different plants, and no farmer should rely exclusively on a single plant. More and greater reliance should be placed on Corn, which, under the most unfavorable conditions, will produce good and cheap forage. Sorghum must also come to the front as a forage-plant. Soja Bean may be relied on. For fall and spring pasture Blue Grass is the best of all our Grasses. It fails, however, during the summer months, July and August. During this time Corn, Rape, Soja Bean and Cow Pea may be substituted.

Agricultural College, Ames, Iowa.

L. H. Pammel.

Recent Publications.

The Woman's Book. Dealing practically with modern conditions of home-life, self-support, educational opportunities and every-day problems. In two volumes. New York : Charles Scribner's Sons.

These large elegant volumes, with their four hundred illustrations, touch upon such a wide range of topics that it is easy to understand why so many authors were engaged in their preparation. On the intellectual side of life, such subjects as Books and Reading and the art of travel are treated by T. W. Higginson and Elizabeth Bisland, with an important chapter on the Education of Woman, by Rev. Lyman Abbott. On the practical side, P. G. Herbert and Mary Cadwallader Jones write of the various fields of useful activity which are now open to women, and W. O. Stoddard gives instruction in such details of business affairs as keeping accounts and the management of real estate. The various branches of household economy are discussed by Lilian W. Betts, while hygiene of the home and the training of children are the subjects of articles by J. W. Roosevelt, M.D., and Kate Douglas Wiggin. Besides this, we have essays on the aesthetics of dress and of house-furnishing, with the inevitable instructions in regard to behavior in polite society. Altogether, the book is as useful as it is beautiful, which is saying a good deal, as no better specimen of the bookmaker's art than this has lately appeared from the press at such a reasonable price. It is really an encyclopædia on most of the subjects in which women are interested, and it treats them in a broad way,

while a very complete index makes all its information readily available.

The special matter which brings a book like this within the scope of a notice by GARDEN AND FOREST is found in two chapters: one on Home Grounds, by Samuel Parsons, Jr., and another on Flower Gardens, by Mr. J. N. Gerard. Mr. Parsons writes in an instructive way of the good and bad features of building lots, with directions for draining, and some excellent advice about the situation of a dwelling-house and the grading of its surroundings. He next takes up the subject of planting, gives the most approved methods of arranging the lawn and of planting its borders, with lists of trees and shrubs which will be found useful, and the best way to group them. One might readily criticise his selection of trees and shrubs, but no list would satisfy every one, and his descriptions of various plants with their special adaptations will be helpful to the novice. It is not an easy thing in the space of thirty pages to give a great amount of instruction on the planning and planting of home-grounds, but the advice, so far as it goes, is sound, and it will be useful if it does no more than convince the reader that there is such a thing as a proper arrangement of home-grounds, that this is a matter worth study and inquiry, and that the preparation for it should begin at the very beginning, not only before the house is built, but before its location is decided, so that house and grounds together may be one consistent scheme.

Mr. Gerard's field is rather more restricted, and, therefore, he goes more into detail, and gives the best of counsel as to the preparation of the soil, the proper exposure of flower-beds and the selection of plants to fill them. Of the essential matters which should be borne in mind when flowers are to be cultivated for house adornment, few are neglected in this little monograph. There are paragraphs devoted to hardy herbaceous perennials, to annuals, to flowers for cutting, to climbers, to window and veranda boxes, to aquatics, and descriptions of such helps as cold frames and greenhouses, with hints on some specialties like Orchid-culture. The advice is not of that desiccated sort which gets into ordinary catalogues, but the paper is full of little out-of-the-way bits of information which throw side-lights upon the practice of gardening, and cannot help but be beneficial to any woman, or any man, for that matter, who begins in a cautious, experimental way to plant flowers to make his home attractive.

The tenth edition of the *Forest Tree-planters' Manual*, prepared by Mr. J. C. Barrett, Secretary of the Minnesota State Forestry Association, has reached us, and, like earlier editions of this work, contains a large amount of interesting information and stimulating matter. It embraces a list of the indigenous trees and shrubs of Minnesota, with remarks on their distribution in the state and their economic uses and values, with such characters as will assist in their determination. There are articles also on how to manage forest seeds, seedlings and cuttings, filled with practical suggestions, articles on entomology and forest-zoölogy, and on the economic and climatic conditions of the forests of Minnesota. Such publications as these are valuable in increasing the popular knowledge of forests and forest-planting, branches of agriculture in which Minnesota has for many years taken an active part.

The Medical Plants of Tennessee, respecting their commercial value, with an analytical key, descriptions in aid of their recognition, and notes relating to their distribution, time and mode of collection and preparation for the drug market, by Dr. A. Gattinger, of Nashville, has recently been published under the direction of T. F. B. Allison, Commissioner of Agriculture of Tennessee. This is a useful book, containing brief botanical descriptions of the economic plants of the state sufficiently full to make it possible, by the aid of the excellent analytical key, to distinguish them readily, with descriptions of their medicinal uses and commercial value.

Notes.

The Miller Raspberry, which has already been described in this journal (vol. vii., page 300), will be offered by leading nurserymen this spring. It has hitherto been grown only by commercial planters in Delaware and Maryland for the sake of its fruit, and has not been disseminated.

From a private letter dated on the last day of the year we learn that Chrysanthemums were still enlivening the gardens of Santa Barbara, California, with Roses, Violets and *Salvia splendens* still in bloom. *Cestrum aurantiacum* and *C. elegans* were also in flower; the *Libonias*, *Passiflora manicata* and *Bignonia venusta* were showing some blooms, while *Veltheimia speciosa* was just coming on with Paper White Narcissus in full bloom.

The Tree Tomato, *Solanum betaceum*, is a shrubby plant, a native of Central America, growing to a height of five or six feet with large shining leaves, fragrant flesh-colored flowers and fruit said to be as large as a duck's egg and of similar shape. It is at first purple, but gradually assumes a warm reddish color, so that the plant is really ornamental as it is grown in southern California. The plants bear the second year from the seed and the fruit ripens continuously for several months. The fruit will never be of any commercial importance, but it may be eaten raw, and when it is stewed with sugar it has a slightly subacid flavor which is very refreshing.

The forty-sixth volume of the *Garden*, which begins with the first issue of this year, is appropriately dedicated to Mr. Edward Whittall, the English merchant of Smyrna, who has enriched English and American gardens with many new and beautiful plants from the hills of Asia Minor, many of which are perfectly hardy. Among these are species and varieties of *Crocus*, *Chionodoxa*, *Cyclamen*, *Fritillaria* and *Sternbergia*. Mr. Whittall is still a young and active man, and we cordially unite with Mr. Robinson in wishing that he may live long to continue the good work of distributing plants which have for ages bloomed unseen or unappreciated in those mountain solitudes.

A bulletin which gives notes on the Strawberries grown at the Geneva Station, New York, last year, contains an illustration of four rows of a seedling raised at the station and known as No. 198. The strong, upright fruit stems and large, vigorous leaves are conspicuous. This variety was only exceeded in total yield by five others, and it was especially noted for its large production late in the season, three-fourths of the entire crop, 144 ounces on thirty-three square feet, having been picked after the third of July. This is a remarkable showing. The berries are of a good dark color and large size, but they are not of the highest quality. The extreme lateness of its season of bearing, however, ought to give this variety a special value.

We are sorry to learn that Mr. C. M. Atkinson, one of the best all-round gardeners that America has seen, has been obliged, through physical infirmity, to retire from the charge, which he has held for nearly thirty years, of the gardens and estate of Mr. John L. Gardner, of Brookline, Massachusetts. This place has long been known to lovers of horticulture for its well-grown fruits and flowers, and especially for many of those old-fashioned hard wood greenhouse-plants which are so sadly neglected in most gardens of the present day, and which Mr. Atkinson grew to perfection. His skill, however, was not limited to any single field, and he was equally successful with Azaleas, Japanese Irises, Roses, Orchids, Violets, and all sorts of greenhouse and hardy plants.

At the meeting of the directors of the various experiment stations in Washington last autumn there was exhibited the photograph of a Tomato-plant which originated in the garden of Colonel M. V. Moore, of Auburn, Alabama. The plant covered a trellis about fifteen feet square, and it was said that during the season it produced more than four hundred well-developed fruits, some single specimens of which weighed nearly a pound, the average weight being about six ounces, or a hundred and fifty pounds, say, as the entire yield during the season. The fruits were round and smooth, and they grew in clusters of from three to seven. The flesh was solid, richly flavored and finely grained. The plant has been perpetuated by cuttings, and seed of some of the largest fruits has been preserved.

A late number of the *Gardeners' Magazine* contains an excellent illustration of a fruiting branch of the Sea Buckthorn,

Hypophaë rhamnoides. In his description of the plant, Mr. George Nicholson says that few growers of trees and shrubs are acquainted with the plant, although its bright orange-colored berries set closely along the branches and remaining all winter long, make it especially valuable. The fruits are somewhat bleached by hard freezing, but in late autumn they literally glow in the bright sunlight. *Hypophaë* is hardy in our northern states, but it is less common here in cultivation even than in Great Britain; in fact, we have never seen good fruiting plants of it in America. The genus is diceous, and the staminate plants are, of course, useless for decorative purposes. That it should be better known and more generally grown must be the opinion of any one who has seen it in some Swiss valley in September, when its bright fruit makes a striking display.

The latest news from Florida shows that the orange crop will not be a total loss in some of the groves in the central part of the state and along the south-western coast. Although heavy frosts prevailed in these parts and the thermometer fell to twenty-eight degrees, there was no long-continued cold, as throughout other sections, where the freezing weather lasted for three days, and the oranges were frozen solid on the trees. Later on these oranges dropped, and the ground was thickly covered with useless fruit, and in many instances the leaves also fell, while the bark burst the entire length of the trunks. Besides the supplies of Mediterranean fruit under way to supply the deficiency, the New York market is ready to take the supply from Jamaica, Porto Rico and Cuba, so that, although there will not be as many oranges of the first quality as was expected, there will be no scarcity of fairly good fruit at reasonable prices. In ordinary seasons the shipments of oranges from Jamaica stop when the Florida season is fully under way, and this is true also of Cuba oranges. Jamaica oranges sold at auction on Saturday at \$4.50 a barrel for the best, while damaged Florida fruit could hardly be sold at any price. Mediterranean oranges are selling at wholesale for \$2.50 to \$3.00 a box. Tangerine oranges bring \$5.00 a box for a grade which brought \$2.50 a fortnight ago. Almeria grapes of good quality can be had for thirty cents a pound. Hot-house strawberries from New Jersey cost \$3.00 a pint, and hot-house pineapples from Florida may be had as low as thirty-five cents each.

Dr. Bornet has published in the *Bulletin de la Société Mycologique de France* a sympathetic notice of Philibert Picart, the French engraver, who is specially known to Americans by his engravings in Engelmann's classical work on *Cactaceæ*, and in the first volumes of Sargent's *Silva of North America*, upon which he had been exclusively engaged for several years before his death. "Philibert Picart," Professor Bornet tells us, "was born in Paris on the 2d of December, 1825. A pupil in the School of Design of the Rue de l'École de Médecine, he obtained, at the age of sixteen, the highest prize given in that establishment. Soon becoming the principal support, and then the head of a numerous family, he would have been obliged to abandon it for military service had not Louis Philippe generously come to his rescue and purchased a substitute for him from his private purse. With the assistance of his mother, who was as brave as himself, he succeeded, by persistence and self-sacrifice, in bringing up his six brothers and sisters. One of his brothers, Eugène, who was also an excellent engraver, was, until the end of his life, the assiduous assistant of Philibert, dying two years before him. The list of the great works to which Philibert Picart has contributed is a long one. *Les Quinquinas de Weddel*, the *Cactaceæ* of Engelmann, *l'Arboretum Segrezianum* of Lavallée, the Plants of the Orient of Jaubert & Spach, the *Jardin Fruiter du Muséum* of Decaisne, the *Chilian Voyage* of Gay, the *Batrachospermum* of Sirodot, the Forest Trees of North America of Sargent, are familiar to every one. A skilled entomologist, the zoologists are not less indebted to Picart than the botanists. 'An indefatigable worker,' said Monsieur Migneaux, in the sympathetic address delivered at his funeral, 'conscientious, an excellent observer, with a talent supple and ingenious, which specialists and savants, whom he aided, can alone appreciate. Picart was certainly the most complete expression of that group of engravers who have illustrated the works of natural history in the second half of this century. Among the multitude of scientific publications to which he contributed it is proper to mention as the most important, perhaps, the works on cryptogamous plants of Tulasne and Thuret. The plates of this work, engraved from drawings of Riocreux, are simply masterpieces, the like of which will, perhaps, never be seen again.' Picart possessed rare unselfishness and integrity. The man was the equal of the artist."

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TABLE OF CONTENTS.

EDITORIAL ARTICLES:—To Preserve the Palisades	PAGE
Jean François Boursault	32
Green Ash in the West	32
Hybrid Oaks in Western Missouri	32
FOREIGN CORRESPONDENCE:—London Letter	33
NEW OR LITTLE-KNOWN PLANTS:— <i>Protea cynaroides</i> . (With figure)..	33
PLANT NOTES	34
CULTURAL DEPARTMENT:—Peach Yellows.....	34
Seed-sowing.....	34
The Newer Chrysanthemums	35
Primula Sinensis	35
Celeriac	36
Lilium elegans	36
CORRESPONDENCE:—Carnations in Flatbush.....	37
Orchids at Short Hills, New Jersey	37
Shall we have an Orchid Society?	37
THE FOREST:—The Consumption of Wood in the Comstock Mine	38
RECENT PUBLICATIONS	39
NOTES	40
ILLUSTRATION:— <i>Protea cynaroides</i> , Fig. 5.....	35

To Preserve the Palisades.

IN one of his journals, Thoreau, in speaking of the natural beauties of a country, declares that they have a high use which dollars and cents cannot represent. If the inhabitants of any town or state were wise they would spare no pains to preserve such beauties, for they furnish a kind of education that no hired teachers, preachers or school systems can supply. The most impressive object he found in a certain New England town was a noble Oakwood to which he felt assured that men from all parts of the country would make pilgrimages a hundred years hence if the town would only save it. But if the people there were of the same temper with the inhabitants of many other towns they would estimate the value of the grove only for what the trees would bring as timber. In many countries precious metals belong to the crown, so here more precious objects of rare beauty should belong to the public. The summit of Mount Washington was once in litigation before the New Hampshire courts, which were to decide whether it belonged to A or B. "Think of a mountain-top," he adds, "which even the Indians revered as a sacred spot, only accessible through private grounds—a temple which no man can enter without the danger of letting out or letting in somebody's cows!"

No doubt, this is fundamental truth on which Thoreau here takes his stand, but, after all, he is bringing up a form of the old and ever-recurring problem, how to reconcile the rights of the individual with the rights of society. The ocean is free to every keel, and yet there are miles along our coast-line where the people are fenced away from its beach, as if they had no right even to look at a spectacle which in all time has been a source of health and inspiration to man. Places with a history which ought to stir the pulse of patriotism have been degraded into low resorts by landowners, who prize and use their historic associations simply as an advertisement. But it is not just to denounce people as criminal for using what is their own property as may suit their advantage within the limits of the law. If any one is censured, the blame should not rest solely on the men who devastate natural beauty or places rendered

sacred by some noble action in the past. It is rather the fault of society, which has never decided what are the rights of the individual to the beauty of the world into which it has been born. One reason for this is that we do not recognize the real value of such spectacles and associations as an uplifting and civilizing force. Libraries have been written to prove the value of art as a refining influence on society, and a man would be justly considered a vandal who should destroy a priceless painting of some old master, even if it were his own private property. But vandal is a harsh word to apply to the men who are blasting down the face of the Palisades and defacing the dignified portal through which one of the noblest rivers of the world enters one of its noblest harbors, and yet no one can deny that the destruction of the Palisades would be a calamity more serious than the loss of any work of art on the continent.

We allude once more to the danger which threatens the Palisades because the Governor of New Jersey in his late message invited the attention of the Legislature to the matter, and has suggested the passage of certain acts which he thinks will prevent this magnificent natural rampart from becoming a prey to the quarryman. The purchase of the Palisades throughout their entire length as a public park Governor Werts considers out of the question on account of its expense. What gives the rock its market value, however, is its proximity to navigable water and the ease with which it can be loaded for transportation. Some of the riparian rights of the state have been disposed of, but it still practically owns two and a half miles of the shore, including those portions now utilized by the quarrymen. The Governor recommends that the riparian laws of the state be so modified that the building of stone-breakers or piers for working and loading the rock shall not be permitted on the state lands, and that none of the water-rights of the state shall be disposed of without such limitations as will make the work of quarrying unprofitable. We are by no means assured that such legislation would save the Palisades. Nevertheless, it would be well if such a law were enacted, so that a practical test of its value could be made.

Another suggestion in the message of Governor Werts is to be commended without reserve, and that is the appointment of a commission under a general act to receive and hold such lands in the state as they may deem for any reason worthy of reservation for public use. This is practically a similar commission to the one organized in Massachusetts, which we have had frequent occasion to speak of with approval. If the people of any state feel that their rights in spots which are hallowed by tradition or are inspiring by their beauty are being infringed upon, they must organize to assert these rights, and no better plan has yet been devised than this board of trustees of public Reservations in Massachusetts. There are few other states in the Union where a man who owns a battlefield or a waterfall in fee simple can give it to the public, much less sell it, because no one is entitled to hold it legally for the state. The existence of a continuous body like these trustees is a constant invitation to public-spirited citizens to make over for the public use forever many places which ought to be reserved. Governor Werts thinks that if such a commission in New Jersey could secure a few points on the Palisades besides those which would be protected under the modified riparian act the danger would be averted. Let us hope that this will prove correct.

In any event, neither New Jersey nor any other state can err in organizing a perpetual board of trustees to hold forever all places whose history or natural character justifies their reservation as public property for public use. It is a pleasure to add that, since the foregoing paragraphs were written, a bill has been introduced into the New York State Senate to create a commission for this purpose, composed of eminent citizens from different parts of the state, and that the bill expressly authorizes the commission to coöperate with similar bodies in other states, where joint action is

desirable for the preservation of such places as the Palisades.

Jean François Boursault.

EVERY one knows the Boursault Rose, of a race of hardy climbers, whose parent is the European *Rosa alpina*, although probably very few people know much of the man, once a conspicuous character in Parisian life, whose name it now best commemorates; and we are glad of the opportunity to publish some facts concerning him, for which we are indebted to our correspondent, Monsieur Edward André, of Paris.

Jean François Boursault was born in Paris in 1752, or, according to the *Dictionnaire Larousse*, toward 1760, and died in Paris in 1842. He was the great-grandson of Edme Boursault, a poet and author of some celebrity, and the son of a linen-draper in easy circumstances of the Quartier des Innocents. Boursault early left Paris to follow a band of traveling players, making for himself some reputation in his earliest rôles. Admiration for his ancestor, the dramatic author, influenced his choice of the theatrical profession, and out of respect to the memory of his name, which he did not want to run the risk of having hissed, he adopted that of Malherbe, which he retained as long as he continued on the stage. Boursault established a French theatre at Palermo, but being unfortunate and his affairs involved, he took advantage one day of King Ferdinand's passing to throw himself into the sea. This excellent method of getting his head above water, as a wit of the time remarked, succeeded admirably. A crowd collected, the curiosity of the king was excited, and Malherbe, who had been fished from the water, was brought before him. The actor described his miserable condition in such a dramatic manner that the sympathy of the king was moved and he gave him money enough to pay his debts. Returning to Paris at the beginning of the Revolution, Boursault plunged into the movement with enthusiasm, but soon afterward returned to the stage, and had built for himself in the Passage des Nourrices, between the Rue St. Martin and the Rue Quincampoix, a theatre which he called Théâtre Molière. In 1806 Boursault changed the name of his theatre, which he now called Théâtre des Variétés Étrangères, and undertook to play Shakespeare, Schiller, Lope de Vega, etc., an undertaking which soon failed. Next we find him engaged in cleaning the streets of Paris. His street-cleaning contract and the gambling-houses, which he obtained control of later, made him immensely rich, and he became known for his taste in horticulture and his collections of plants. The garden of his villa in Rue Blanche and his gallery of pictures were among the most famous in Europe. He collected in his hot-houses the rarest plants of the two hemispheres. In 1830 he bought for three millions of francs the Salle Ventadour and became director of the Opéra Comique. This venture was not successful, and he was on the point of failing, but eventually was able to save his fortune. After this, with the capriciousness of old age, Boursault sold his famous gallery, pulled down his hot-houses, which were the richest and best-stocked in France, and, perhaps, in Europe, destroyed his park, building on its site two rows of houses, which now form the Rue Boursault. This was his last fantasy and his last undertaking, for he died shortly afterward, leaving a large fortune.

Green Ash in the West.

AMONG hard-wood trees the Green Ash has been more extensively planted in the west than any other species, and the method pursued illustrates better, perhaps, than in the case of any other tree, the lack of forest knowledge on the part of planters. The Ash is a light-foliaged tree, and, though slow in growth, it requires full sunlight for its best development. Planted in solid plats, or mixed by rows with other species, it does not shade the ground

enough to prevent the growth of weeds and grass, and hence in the west the strong prairie grasses check its growth very seriously. Planted pure in this way, the trees are also apt to grow crooked, and, therefore, when they have attained useful size they are of much less value than if they had been forced to grow straight, as they do when closely surrounded by Box Elders or other good shade-makers.

The Green Ash has a wide western range, extending from the Dakotas to Texas, and following along the streams from the Missouri to the mountains. Although it prefers the deep moist soils of river-bottoms, it can be grown better on upland than many other trees, but its growth in such situations is much slower than it is in moister ground. In the forest plats of the South Dakota Agricultural College, at Brookings, Green Ash is grown more slowly than White Elm, Black Cherry, White Birch, Box Elder or the Poplars, but faster than Burr Oak and Black Walnut. Planted among Box Elders at Brookings it reaches up for the light, and there is little doubt that at ten years of age the Ash will equal, if not overtop, the Box Elder.

I was much interested in the forest-trees growing in the town of Hastings, Nebraska. In the early settlement of the country, about twenty years ago, Mr. Alexander planted a tree-claim near the town, which, in course of time, was divided into town lots, and now the best residence street of Hastings is made beautiful by these plantings. A great many Green Ash are included in this artificial grove, and so greatly do the trees vary in size and in the shape of their seeds that I was strongly of the opinion that there were both White and Green Ash in the plantation. A comparison of the seeds with that of White Ash as grown here, however, proves all the Hastings trees to be Green Ash. It indicates a very great range within the species, both as to habit of growth and form of seed, and explains the very common error, in the west, of mistaking *Fraxinus Pennsylvanica*, var. *lanceolata*, the Green Ash, for *F. Americana*, the more common eastern species.

Washington.

Charles A. Keffer.

Hybrid Oaks in Western Missouri.

NOT having given much attention to the Oaks of Jackson County, Missouri, beyond noting their geographical and geological distribution, and not having observed any hybrids, I had come to think that there were none in this part of the state. Engelmann had observed and described a number of forms from eastern Missouri and western Illinois, and had even proposed several of these as species, but they have all been enumerated as hybrids in the last edition of Gray's *Manual*. Supposing that hybrid Oaks were comparatively rare, I had not taken the trouble to watch out for them until my attention was attracted by a remarkable one, which I at first thought was the offspring of *Quercus alba* and *Q. Muhlenbergii*, and since then I have learned that these hybrids are comparatively common. Of the six hybrids mentioned below I do not recollect to have seen any one described, and they certainly are not given among those in Gray's *Manual*.

Several years ago I observed a tree which seemed to be the offspring of *Quercus alba* and *Q. macrocarpa*, near Courtney, Missouri. This was the first I had seen here. The general appearance of the tree was that of *Q. macrocarpa*, the leaves even being lyrate, but the fruit was plainly that of *Q. alba*. I gave the tree little attention at the time, and it was not until I had discovered the tree mentioned above that I thought of it as a hybrid. Three years ago I found another tree which I took to be a hybrid between *Q. alba* and *Q. Muhlenbergii*. I had sent this to Dr. Britton and Professor Trelease as *Q. alba* × *macrocarpa*, and the former wrote me that the fruit was exactly of the eastern *Q. Prinus*, but it is a clear *Q. macrocarpa* × *Muhlenbergii*, as I afterward ascertained by a critical study of the tree and the species in the neighborhood of it.

Two years ago I found what I took to be a hybrid of

Quercus alba and *Q. Muhlenbergii*, and after observing it for three successive seasons I still think it the same.

Last fall I discovered several more hybrids, and will mention those that I noticed more particularly. A hybrid *Quercus macrocarpa* × *Muhlenbergii* was found one mile east of Independence in a grove of Red and Shingle Oaks. It has the light-colored trunk and smoothish limbs of *Q. Muhlenbergii*, but some of the leaves resemble those of *Q. Muhlenbergii* and others those of *Q. macrocarpa*, while the fruit is exactly between that of *Q. macrocarpa* and of *Q. Muhlenbergii*, and has no fringe. Another hybrid was observed by myself and Rev. Cameron Mann near Sheffield, in this country, and quite a number of trees were noted. The tree appears to be *Q. macrocarpa* × *bicolor*, and they occur in a grove where *Q. bicolor* and *Q. imbricaria* were the prevailing Oaks, with no sign of *Q. macrocarpa* present. The trunks were generally light-colored, as in *Q. bicolor*, and some of the leaves were those of that species, and others were like those of *Q. macrocarpa*. The fruit was intermediate in character, but approached that of *Q. bicolor* in shape and *Q. macrocarpa* in size.

Another tree, a hybrid evidently of *Quercus rubra* and *Q. imbricaria*, was found a mile east of Independence, standing alone in a pasture, but the supposed parents were both present within a short distance. The leaves exhibit all gradations between those of *Q. rubra* and those of *Q. imbricaria*, and the fruit is intermediate between the two species, and larger than the fruit of *Q. imbricaria*.

These six hybrids are derived from six different species, and from the apparent ease with which they intermingle it is expected that there are many more in this locality.

Specimens of all but the first one of the trees noted above are deposited in the herbarium of the Missouri Botanical Garden and in the herbarium of the Arnold Arboretum.

. Independence, Mo.

B. F. Bush.

Foreign Correspondence.

London Letter.

TALAUMAS.—Sir Joseph Hooker begins the one hundred and twenty-first volume of the *Botanical Magazine* with a figure of *Talauma Hodgsoni*, prepared from a plant which flowered for the first time in cultivation in the temperate house at Kew this summer. The species was discovered by Sir Joseph in 1848, in the eastern Himalaya, forming forests in the valleys of Sikkim, at an elevation of 6,000 feet. He describes it as "one of the noblest of the flowering forest-trees of the Himalaya, a country which, considering its narrow area, contains, perhaps, more handsome Magnoliaceous trees than does any other of equal dimensions in India, if not of the world." The handsomest of all is, of course, *Magnolia Campbellii*, which is hardy in the warmer parts of this country, and forms a big shrub in the neighborhood of Cork, and when in flower has no rival among the Magnolias grown here.

Talauma Hodgsoni was received at Kew about twenty years ago, and for a time grown in a tropical house. About seven years ago it was removed to the temperate house, where one of the plants is now a handsome tree twenty-five feet high, with leaves two feet long. In Sikkim it grows to a height of forty feet, forming a thick trunk sometimes six feet in girth. The flowers, which are produced singly on the ends of the branches, are six inches across, the fleshy sepals colored vinous purple externally, the petals white, tinged with rose at the tips. They are very fragrant and, unfortunately, very fugacious.

I noticed the flowering of this plant in one of my letters to GARDEN AND FOREST a few weeks ago, and shortly afterward received from Mr. H. Nehrling, of the Milwaukee Public Museum, a letter suggesting that as the genus *Talauma* would probably be useful for gardens in the southern United States it might be worth while calling special attention to them in these pages.

The genus is closely related to *Magnolia*, differing only

in the arrangement of the carpels and their mode of dehiscing. They are all trees or shrubs, and, so far as I know, evergreen. The flowers are generally large and very fragrant. Fifteen species are known, and in their distribution they are very remarkable, being found in South America as well as tropical and subtropical Asia, extending up to Japan. Only few of them have as yet been introduced into gardens, the oldest among those now in cultivation being *Talauma Candollei*, which first flowered at Kew in April, 1862, and has flowered there probably every year since. It is grown in the Palm-house in a pot, where it forms a leggy shrub, six feet high, with ovate dark green leaves six to ten inches long. The flowers are solitary on the ends of the branches, nodding, about six inches across when fully expanded, the sepals and petals fleshy, creamy white, changing with age to a tawny brown, and, from the time when the buds first burst to the fall of the petals, emitting a powerful and delicious pineapple-like odor, one flower being sufficient to fill the whole of the large Palm-house with a pleasing fragrance. Dr. Lindley says it can only be propagated by grafting it on *T. pumila*, but cuttings of it have been rooted at Kew. The plants grow very slow. They require stove treatment, an example tried in the temperate house at Kew having succumbed to the first low winter temperature. In Java, where *T. Condollei* is a native, it grows to a height of fifteen feet. In the *Botanical Magazine*, t. 6614, there is a figure of a smaller-flowered form which had been sent to Kew by Louis Van Houtte, the Belgian nurseryman, as *Magnolia Galleotiana*.

Talauma pumila is another Javanese species, much dwarfer and bushier than *T. Hodgsonii*, and, though smaller in flower, quite as powerfully fragrant. It has been grown at Kew many years, forming a bush two feet high, with ovate dark green leaves four inches long, and yellowish white flowers three inches across. A plant has been in the temperate house for some years, but it grows slowly there, and rarely blooms, whereas in the Palm-house it flowers annually.

Talauma Plumieri is a native of Dominica and St. Lucia, in the West Indies, but it has not yet been introduced into gardens. It forms a large tree, often eighty feet high, the wood of which is strongly scented. The leaves are ovate, four to six inches long, glabrous, with strong venation, and the flowers are as large as in *T. Hodgsoni*, white, tinged with pink, and very fragrant.

Talauma ovata was discovered in the Organ Mountains, Brazil, by Gardner in 1838. He describes it as a large tree about forty feet high, growing in swampy places, and says the powerful odor exhaled by the flowers extended more than half a mile from the tree. The flowers, which are as large as in *Magnolia conspicua*, are of a dull yellow color, and the fruit as large as a man's fist. Another name for this species is *T. fragrantissima*.

Talauma gigantifolia, a native of the Malay Peninsula, is remarkable for the size of its leaves, which are sometimes a yard long and a foot wide. It forms a large tree, the flowers being four inches across, white and very fragrant.

Talauma mutabilis, a native of Moulmein, is very similar to *T. Candollei*, and has white, very fragrant flowers.

London.

W. Watson.

When vistas are to be cut through tall-grown wood a clear idea of the effect from every view-point is essential. This can be gained at any season, but the work is most successfully done in spring; for the structure, as well as the outline, of each tree may then be distinctly seen. During some days accordingly, as the progress of vegetation is slow or rapid, scarcely any two trees are exactly of the same color; while one retains its wintry hue, another is forming colored buds, a third is in fuller bud, a fourth bursting, a fifth in pallid leaf, a sixth of a deeper tint, so that, at this critical juncture, the branches of adjoining trees may be seen distinctly, how intimately soever they may be mixed with each other; and thus the outline of either may be seen, before the other be removed.—*Planting and Rural Ornament*, 1796.

New or Little-known Plants.

Protea cynaroides.

SOME account of cultivated Proteas, with a figure of *P. nana*, one of the small species of the genus, was given in GARDEN AND FOREST, vol. iv., p. 412. The figure on p. 35 is from a photograph of a specimen of the largest-flowered species, which is grown in a sunny, dry greenhouse at Kew, along with Agaves, Aloes and other succulent plants. Here it is planted out in a bed of gravelly soil, and it is now eight feet high, with half-a-dozen stems, each an inch in diameter, clothed half-way down with bright green leathery leaves, not unlike those of a Griselinia. The flower-heads are large, the largest like the flower-heads of Artichoke, *Cynara Scolymus*, and colored bright pink. They last a long time, several months, and are very attractive, both in form and color. When I was in South Africa in 1887 I saw thousands of these plants growing wild on the sides of hills, their roots among the large stones which were thickly strewn among the gravelly soil and their stems four or five feet high. I never saw one as tall as the plants at Kew, and this is to be accounted for by the stems breaking off at the base easily if unsupported. At Kew they are supported with a stake, consequently stems which have flowered push into fresh growth at the top and flower again.

The inflorescence of Protea is composite, a large number of small flowers being aggregated in a head and surrounded by colored leaves on bracts. When the heads of *P. cynaroides* first open they are full of honey and are known to the Boers as honey-pots. This honey is collected and made into a kind of sugar. I saw large bushes of other species of Protea in the neighborhood of Grahamstown, some of them in flower, and they were quite as effective as big specimen Rhododendrons are when in bloom. They all grew in fairly exposed situations on the hill-sides, and often in positions where there was very little soil for the roots. They ripen seeds freely. Proteas would be excellent shrubs for the gardens of the southern United States. There are about sixty species of them, all African, and all sufficiently attractive in flower to be worth a place in the garden. Once they were popular in English gardens, but now they are practically unknown here.

London.

W. Watson.

Plant Notes.

RICHARDIA ELLIOTTIANA.—This Calla, as we saw it in the Temple Garden Show, in London, last spring, was a most interesting plant, with its spathe of clear rich yellow and its foliage mottled like that of *Richardia albo-maculata*. Comparatively few plants have yet been imported into this country, but last week we saw them flowering in one of the houses of Messrs. Pitcher & Manda at Short Hills, New Jersey, and our good opinion of the species was confirmed. Three years ago an account was given in our London letter of the sale of the stock of this plant at auction by Captain Elliott, who had originally raised it from seed which he had received as that of a red-spathed Calla. He increased the stock by seed and offsets until he had some two hundred and fifty plants, and he sold these at auction for more than \$2,000. The plant had already received the first prize as the best new plant in bloom at the International Horticultural Exhibition at Earl's Court, in London. It differs from the yellow-flowered *R. Pentlandii*, which is tinged with purple at the base of the spathe on the inside, and which does not have the finely mottled leaves of *R. Elliottiana*. As observed at Messrs. Pitcher & Manda's, the plant seems quite as vigorous and floriferous as the ordinary Calla, although the leaves appear somewhat more dwarf, so that the flowers stand higher above the foliage. The tuber resembles that of an ordinary Caladium, and every tubercle, if removed and carefully attended to, will grow into a flowering size in less than two years. There can be little doubt that this yellow Calla will soon

find its way into every collection of plants and every florist's establishment throughout the country.

COREOPSIS GRANDIFLORA.—An excellent colored plate of this, the best of all garden Coreopsis, is published in a recent issue of the London *Garden*, and it reminds us to repeat what we have already stated more than once, that this plant was long distributed in this country, and is now largely known in gardens here as *C. lanceolata*; that is, a better plant was sent out in the place of an inferior one, the true *C. lanceolata* being a good perennial, but not nearly as showy since the flowers are much smaller. The plant, however, is much hardier, since the crowns of *C. grandiflora* are quite often killed by New England winters if it is left outdoors. The latter is more inclined to a tufted habit, and when grown in pots for early spring decoration it is a most useful plant. The difference between the two plants is easily recognized, even in the seeds, those of *C. grandiflora* being larger and not so dark in color as those of *C. lanceolata*. The true *C. grandiflora* has been distributed as *Coreopsis "Harvest Moon,"* and will be readily recognized under this fanciful though inaccurate name. In the length of its flower-stalks, the size of its flowers and the freedom with which they are produced, *C. grandiflora* is the best of the garden Coreopsis, and its liability to winter-kill in the north is not so much of a drawback as would be expected, owing to the freedom with which young plants are produced from self-sown seed in the borders. These are harder than two-year-old plants, and live through the first winter, flower the next year, should then be replaced by self-sown plants or by some that have been protected over winter in cold frames.

CHOROZEMA VARIUM, VAR.—A correspondent writes of a seedling from a variety of Chorozema varium which seems to have a more compact habit than the parent plant, and is now covered with racemes of richly colored flowers, which are almost as large as those of a garden pea. This is much larger than these flowers usually are, but they vary much, and European nurserymen now offer garden varieties said to be much superior to the old kinds. Many of the old kinds are excellent plants, and not really difficult to manage if they are hard cut in after they have done flowering, repotted firmly and allowed abundance of air and light always. They seem to do better here in the open air during summer, so that the new growth will become thoroughly ripened. The Chorozemas are Australian hardwood shrubs, and the flowers are most of them red and yellow in different shades and mixtures. Most of the flowers are much smaller than those of the variety noted, but what they lack in size they make up in abundance, and in late winter and spring they are excellent for decorating conservatories. In southern Florida, like many other of the Australian shrubs which can endure dryness at the root for some time, they do admirably in the open air.

Cultural Department.

Peach Yellows.

PROFESSOR L. H. BAILEY, of Cornell University, has been making a careful examination of Peach orchards in western New York, where there have been complaints of the yellows, and has been publishing some notes on the subject under the direction of the State Commissioner of Agriculture. Some of his conclusions are these:

The yellows is a distinct disease, attacking the Almond, Apricot, Japanese Plum, as well as Peach, and it attacks thrifty as well as feeble trees. It has been recognized as a disease for a century; is communicable from tree to tree; is incurable, and the termination is always fatal. Its cause is wholly unknown, and no fertilization of the soil will cure it or check its spread. The one very unmistakable symptom by which it can be recognized is the red-spotted character of the fruit, the flesh being marked generally by red lines or blotches beneath the spots. These peaches generally ripen prematurely the

second year ; they afterward come smaller and more fuzzy than the normal fruit. The first symptom to appear on the trees, rather than on the fruit, is the so-called " tips," that is, the short undergrowth starting from the upper or terminal buds, usually late in the season and characterized by narrow,

limbs, and in advanced cases the shoots may branch into close bunchy tufts. In the final stage of the disease there is a small and slender growth of all new wood with small narrow yellowish leaves, and occasionally a profusion of slender branched growths in the centre of the tree. Diseased trees die generally in five or



Fig. 5.—*Protea Cynaroides*.—See page 34.

stiff, yellowish, small leaves standing out nearly at right angles from the shoot. These tips sometimes appear after the leaves have fallen in autumn, or before the normal growth begins in spring, and they are often seen upon the ends of water-sprouts. The third special symptom is the slender, stiff-leaved, yellowish shoots which come from the body of the tree, or the large

six years from the first attack, and the only known means of keeping the disease at bay is to exterminate the affected trees, root and branch. The disease is communicated to nursery stock by affected buds and by buds from branches of affected trees which do not yet show signs of the disease. Pits from affected trees may also be expected to propagate the disease.

Seed-sowing.

If a greenhouse is available this is the best possible time to sow seeds of herbaceous plants that were not sown in the fall when gathered. An ordinary greenhouse temperature is most suitable—that is, a temperature such as is required for Carnations, of fifty degrees at night, with a corresponding rise during the daytime with sun-heat. When first sown, the seeds should be covered with some non-conducting material, as a thick sheet of paper. Chopped moss is advocated by some growers, and this answers well enough if it is known about what time the young plants will appear. But if, as often happens, the seeds are slow in germinating, it is not well to use the moss. If the seeds are covered with glass it must be turned each day to get rid of the superfluous moisture, or they will decay. We never use glass except for very small seeds, to avoid too frequent watering and the consequent washing out of the soil that sometimes takes place even from spraying. All the smaller seeds should be placed by themselves, so that they can have special care and attention. Small seeds are often sown too deep, and so fail to germinate. A safe rule is to cover them with a depth of soil equal to the size of the seeds. A suitable soil is one composed of equal parts of loam and leaf-mold, with plenty of sand to make it porous, and, if it is possible to obtain charcoal-dust, this is beneficial, but this is not easily obtained now. When Japanese Lily-bulbs were exported in this material it was more generally used, and proved of great value in all potting soils. Any one who has charcoal-dust for sale would do the gardening public a kindness by making the fact known.

Seeds of hardy plants especially are best sown thinly over the surface. Seedlings which are thickly crowded are necessarily weak, and if decay does not set in in the seed-box it is likely to attack them after they are transplanted. A heavy watering followed by a dull day is often the cause of great mortality and disappointment.

Seeds sown now will make strong plants by April, when they can be hardened off in a frame, and later on planted in the open ground. By sowing seeds of herbaceous plants now this work will be out of the way before the seeds of garden annuals require to be sown, a real advantage where many annuals have to be sown each year.

E. O. Orpet.

The Newer Chrysanthemums.

ON page 18 of the current volume of GARDEN AND FOREST Mr. J. N. Gerard comments on the newer varieties of Chrysanthemums as compared with the older kinds, and adds that little attention has been given to the raising of such varieties as will bloom in the open garden. In part this is true, and in part it is misleading. For many years much attention has been given by European growers to early-flowering varieties that will bloom to advantage, and thus make attractive outdoor plants. These are known as the Madame Desgranges (*syn. G. Wermig*) type, and in Europe they have been found to be a useful class of plants. Messrs. Peter Henderson & Co. enumerate a large number of the more recent early-flowering varieties in their catalogue of last year, and doubtless there are many other growers in this country who devote considerable space to them. But, so far, they are an unsatisfactory group in our climate. The hot days and cold nights of our autumn months can hardly be called favorable to their best development, and hence, to insure a crop of good flowers, they must be grown under glass, like the later-blooming kinds.

A great deal is said about the beauty of those old-fashioned varieties that will survive a few degrees of frost. As a matter of fact, most of the modern varieties placed in commerce before 1890—I have not seen the later sorts tested—will live and bloom through similar hardships. It is believed by many persons that the flowers of such plants, old as well as new, are still exquisite when in reality they are seriously disfigured by eight or ten degrees of frost, and I never could see any great beauty in a bloom one-half of whose florets had been blackened by the cold. There are, of course, various contrivances by which plants out-of-doors may be protected from early frosts; but in the case of a plant so indisputably tender as the Chrysanthemum, it seems to me that the expense of a greenhouse would be slight in comparison with the constant trouble and worry in watching the barometer and in placing and removing the protecting material. Many plants of a far harder nature than the Chrysanthemum, such as the Hellebores, for instance, have their beauty much marred by exposure to the elements, and, judged alike from the standpoints of pleasure and expense, I know that it pays to place a cold frame or a greenhouse over such plants.

Peter the Great has been cited as a very desirable variety, and with many others of a bygone generation it deserves commendation. It is one of those good old varieties which have endured the test of time, but which are now being crowded out by the newcomers. Many considerations prompt us to plead for these veterans; they have done yeoman service in the past, and we must feel sympathy for their past triumphs. But their day is over, and the laurels must now go to the newer, and, it must be admitted, the better races. Peter the Great, as I remember it, bore magnificent blooms. But as I have seen it in recent years it is quite as good, so that it is the advance of other kinds, and not the deterioration of this one, that has left it in the rear. The habit of Peter the Great, like that of many old varieties, was ungainly, and to obtain flowers from them of good size and quality it was and, with all our improvements in methods of culture, is still necessary to grow the plants with stems from six to eight, and even nine, feet high. Compare this with many of our modern American varieties, producing blooms of the greatest excellence on stout stems from three to four feet high, and clad with luxuriant foliage almost to the base of the flower.

It may be said that these fine single heads are not the true test of the value of a Chrysanthemum. But when the new varieties will not only endure this test, but will equal or excel the older ones when judged by any other standard, it will be seen that there is little besides sentiment to justify the cultivation of the good old sorts. No doubt, flowers are worth growing for sentiment alone, and if so, let it be admitted frankly. This is certainly better than to claim for old favorites a grace or beauty which they do not possess.

Cornell University.

M. Barker.

Primula Sinensis.

THESE plants are in good form now and will continue to make a fine show for months to come. For the decoration of a cool greenhouse they are indispensable during the winter months, while the double varieties are very useful for cut flowers. The best time for sowing seeds is the end of March or the beginning of April, and a very suitable soil for the seed is equal parts of loam, leaf-mold, with sand to cover the seeds lightly. Heat and moisture is what the seeds need until they have germinated, after which they should be gradually exposed to light and air to prevent them becoming drawn, to which they have a tendency during all periods of their growth. They should be potted singly into small pots when large enough to handle; the soil should be finely sifted and have a little dry, well-rotted cow-manure added. They should never be allowed to become pot-bound, as it causes premature flowering, which greatly retards the growth of the plants. For the final shift six-inch pots are quite large enough, and good specimens can be grown in five-inch pots.

A cold frame in as cool a position as possible suits them best during the summer months; the roots, especially, must be kept cool, which is best done by plunging the pots in ashes or half-rotted leaves, they may be shaded from strong sun, but should have abundance of light and air to keep them strong and bushy. All flower-buds should be pinched off as they appear until about the middle of October, which is also a good time to get them into winter quarters. After flowering commences, occasional applications of liquid-manure is very beneficial, but this must always be applied in a weak state.

The double varieties are hard to procure from seed and are generally propagated by divisions. This is best done by removing a few of the bottom leaves and plunging the plants well down into a bed of leaf-mold and sand, where they will make fresh roots from the bare part of the stem and can be divided into single crowns and potted up separately.

Tarrytown, N. Y.

William Scott.

Celeriac.—Almost every one who relishes celery will like this vegetable quite well, and yet it is rarely seen in country gardens, although it would seem that everything which adds variety to the home table would be tried. The edible part of this turnip-rooted Celery, as it is popularly called, is the root, although the top can be blanched and used, but this is stronger in flavor than celery and not as crisp. The seed should be sown in a flat and covered lightly, and if paper or glass is laid over it any sunny window will be a good position for it, although where there is a greenhouse this is the best place. The covering should be removed before the plants become drawn, and they should be transplanted when an inch high into other boxes two inches apart, where they may remain until they are set into the ground the first of May. The rows should be two feet and a half apart, and the plants may be set nine inches apart in the row. The roots will be large enough to eat early

in September. They can remain in the ground, however, and will continue to increase until heavy frosts about the first of November, when they should be brought into a light cellar where the temperature never descends to the freezing point. If they are set on the ground close together and watered well, the roots will take hold and keep them fresh. Celeriac is good in soups and dressings, and makes a delightful salad when boiled and sliced.

New York.

Lilium elegans.—This Lily, with its various forms or varieties, makes one of the best groups of the whole genus. All of them will thrive in ordinary garden soil, with less care than most species. With me the bulbs take hold the first year and seem quite free from decay. *L. elegans* is a native of Japan, and, thus far, has proved hardy here. The bulbs increase in size so that moderately small ones, if well fed the first year, become large by the second autumn. The price, too, is much in their favor for general use, as most of its varieties can be had at reasonable rates. There are, however, so many forms and synonyms for this group, that one is lost in making a selection from some of the lists. One house in Europe offers no less than thirty-four forms under various names and prices, which, no doubt, might better be reduced to ten or twelve. One variety, called *Elegans semiflore-pleno*, is a half-double form, while there is recently offered, among novelties from Japan, a double-flowered variety called *Elegans flore-pleno*. *L. Thunbergi*, *L. umbellatum* and *L. Batemannii*, together with their sub-forms, all belong to this species. The variety *Alice Wilson* is said to be one of the best, but unfortunately the price is still quite high. Although there are prominent distinctions between many of the forms of this Lily, such as shades of color, height, time of flowering, etc., yet, of the five or six which have been tried here, there is little difference so far as their disposition to thrive with common care. Even in dampish ground, where only such kinds as the *L. superbum*, *L. tenuifolium* or *L. tigrinum* would be expected to prosper, these forms of *L. elegans* have increased and bloomed.

Charlotte, Vt.

F. H. Horsford.

Correspondence.

Carnations in Flatbush.

To the Editor of GARDEN AND FOREST :

Sir,—Among the most extensive growers of Carnations for the New York market are Messrs. Dailedouze Brothers, of Flatbush, Long Island, who have 36,000 feet of glass. In connection with Carnations, they grow a strain of large-flowering Mignonette, which they have established by long continued selection until it is quite distinct, although unnamed. A week ago, when ordinary Mignonette was bringing \$3.00 to \$4.00 for a hundred spikes in New York city, this stock commanded \$10.00 to \$12.00 for seconds. The choicest heads at the same time brought \$3.00 a dozen at wholesale, and the largest trusses were sold by them just before Christmas for as much as \$6.00 a dozen, a price said to be higher than has ever before been realized for Mignonette. These selected spikes were ten inches long, with a good diameter, and were very compact. The stems are stiff and the foliage heavy and flowers close.

The seed is sown about the first of September in solid beds, and in rather heavy soil. The plants are thinned out after they show four good leaves, which is about five weeks after the time of sowing. They are tied up and watered sufficiently often to keep them moist. After they start to flower, liquid stimulant is applied once in two weeks, chemical mixtures, cow and sheep manure and other fertilizers being used in turn, since Mignonette likes a change of food. Strong plants bear six to eight spikes each. The seed is gathered about the 15th of April, the best plants being saved for seed.

Carnations are, however, the main crop here at this time. In houses devoted to the older sorts are long stretches of the variety William Scott, which is considered here the best all-around pink Carnation for commercial purposes. It grows strong and produces freely large pure pink flowers with crisp petals. The later-flowering Madame Diaz Albertini, with its strong clove fragrance, also bears large flowers of good color, the outer petals being a lighter pink than the rest of the flower. Emily Pierson, originated by A. N. Pierson, of Cromwell, Connecticut, is here a good scarlet; it is late, not being ready to cut until after the holidays, but is better than Portia, being a continuous bloomer, with larger flowers and stiffer stems.

The yellow Bouton d'Or, which originated in France in 1889, has been tested in this country without much success and has been given up by most growers. Under the hands of Messrs. Dailedouze, however, it grows strongly and blooms freely

for a yellow Carnation, and is the only variety of this color which flowers abundantly enough to make it a commercial success. It is just beginning to furnish flowers for cutting. They are a good clear yellow in color, with carmine markings on the edge and through the middle of the petals.

Daybreak proves a good standard commercial variety, and has been cut since last fall. It is healthy, with good stem and calyx and of large size, and has good keeping qualities. The fragrant Tidal Wave is considered the best carmine, and has done well for ten years. It has been in bloom since the middle of September. Lizzie McGowan is esteemed the best white. The flowers need to remain long to develop and mature, and ten days from the time they open is not too long to leave them on the plant.

The newer Carnations included Annie Pixley, originated by Albert M. Herr, and sent out last year. It is a tall grower, a good rosy pink of solid color, and is of medium size. Helen Keller grows to extra-large size, and brings the highest price of any Carnations grown. It is considered by the Messrs. Dailedouze to be the best variegated Carnation. Adalina Kresken, sent out in 1894 by Peter Herb, has been a disappointment, the calyx bursting badly. The pink Nicholson does not do well here, and seems to need a lighter soil. Sweet Briar, sometimes called the Sleeping Beauty, resembles Annie Pixley, but is a deeper pink. It stands up well here, although a mile to the south, on lighter soil, it "sleeps" badly. The color is a good pink. Jacqueminot is a glowing bright crimson, sent out by Fisher & Sons. It is small, a fairly good bloomer, and has a good stem. The new white, Uncle John, is a failure here. It lacks constitution and is subject to rust. The Stuart, which took the gold medal in Indianapolis a year ago, is inconstant, too many of the flowers being streaked and poor in form. The few perfect ones are a fine scarlet, with a rich metallic lustre. This variety is not likely to become a standard.

The cuttings of Carnations are made in March, and are planted out the first week in May. In September they are planted in the benches, and the flowers come in salable quantity about the 15th of October. First varieties ready to cut are William Scott, Daybreak, Portia and Lizzie McGowan. Among the latest are Emily Pierson and Madame Diaz Albertini. The earliest cutting varieties, with Tidal Wave, are the most continuous in flowering.

Brooklyn, N. Y.

M. B. C.

Orchids at Short Hills, New Jersey.

To the Editor of GARDEN AND FOREST :

Sir,—This is not the season of the most profuse bloom in Orchid-houses, but flowers are never lacking at the United States Nurseries, and just now a large house filled with plants of *Cattleya Trianae* produces as pleasing an effect of soft colors as one would wish to see. I have no idea how many thousands of plants there are here, but every bulb and leaf seem to rejoice in perfect health, while the flowers are of the largest size and of the richest color. *C. Trianae* is one of the commonest and most popular of Orchids, but there is a wide difference between plants of the best varieties which have been treated to the most intelligent cultivation on the one hand, and the ordinary run of the plants which are allowed to bloom as they will, on the other. I never saw together so many plants of this *Cattleya* which were really of such high quality. Of course, there were some large specimen plants, one of them showing fifty flowers, but the charm of the collection did not come from these conspicuous individuals, but rather from the unusual health and vigor of the entire lot. The firm is cutting these flowers every day by the hundred, and they often have more orders than they can fill. For choice flowers they have realized at wholesale as much as fifty dollars a hundred, which, perhaps, means nearly twice as much at retail, when the expenses and inevitable losses are taken into account. Mr. Pitcher finds that it pays him well to sell Orchid-flowers in connection with the business of selling plants. The demand for them seems to be strong and unflagging, and I saw letters from as far west as St. Paul, and even from Denver, acknowledging the receipt of large consignments of *Cattleya*-flowers in excellent condition. *C. Percivaliana* is just passing out of bloom, but the flowers, although they are smaller than those of *C. Trianae*, have brought good prices, since they come when few other Orchids can be found in the flower market. After the season of *C. Trianae* is over, *C. Mossiae*, with which another house is filled, *C. gigas* and *C. Mendelli* and others will keep up the succession. Many of these plants are showing buds and are making larger and better pseudo-bulbs than they originally grew in their native habitat.

One of the most interesting of the group of Orchid-houses

was a long lean-to against the north side of the brick wall of another house. This house in the rear is really an excavation, so much below the level of the house against which it is built that the sun in the winter never shines upon the plants. The earth has been allowed to remain at its original level under the bench on the south side, so as to bring the moist surface close to the plants, and to serve a similar purpose a tank of water extends under the whole length of the bench on the north side, and above this tank there is continuous ventilation. The wall on the south side is really one side of a long cistern in the adjoining house. This also helps to keep the place cool and moist in summer, so that it is pronounced by experts an ideal house for *Odontoglossums*. It is one hundred and thirty feet long, and it is filled with plants of *Odontoglossum crispum*, which cover the benches and hang from the roof to the number of six or seven thousand. Of course, these are not yet fairly in bloom, although a few sprays have been cut, but the thriftiness of the plants and the strong shoots, which were covered with buds, gave promise of an extraordinary exhibition in four or five weeks. These flowers will all be sold, and retailers will pay for the sprays according to the number of flowers on them at the rate of forty or fifty cents for each single flower.

Cypripediums continue, as of old, a great specialty here, and all of the standard varieties are grown in great numbers. But besides these and all the choicer varieties, there are three or four thousand seedlings coming on in all stages of development, from tiny plants which are just visible above the moss to others in full flower. Among the new varieties in bloom I noted *C. Sallieri Roeblingii*, a cross between *C. insigne* *Amesianum* and *C. villosum*, which shows a fine flower with a wide white margin on a rich chocolate dorsal sepal. *C. Hebe purpureum* is distinguished by its midrib of deep purple suffused with rose. *Alcides* is another fine plant, the offspring of *C. hirtissimum* and *C. insigne*. Near the seedlings is another house showy with masses of *Laelia anceps* and *L. albida* in flower, and it contained a magnificent variety of *Vanda coerulea* in flower. When compared with another variety near it the great spike, which carried something like twenty flowers, seemed to belong to another species. The flowers are larger in every way, the sepals and petals are broader, and the color was a much purer blue.

A run through the houses on the hillside and the group of twenty on the plain below shows considerable change in the character of the stock from what it was a year or two ago. Many of the specimen Palms and Tree-ferns still make the centre house as shady as a tropical forest; but, as a rule, the collection is less miscellaneous than it once was, and there is a tendency to grow in quantities plants of standard varieties which are used by florists. Of course, there are novelties and rarities and specimen plants, so that the searcher for these things will find what he wants, but they are not so conspicuous a feature of the establishment as they once were, Mr. Pitcher having the idea that, owing to the limited number of amateurs who make collections of choice specimens, this part of the business can more easily be overdone than the growing of Palms, Ferns, Araucarias, Dracænas and other plants which form the staple of the florist's general stock. There is no lack of interest, however, in this part of the establishment, and many visitors would probably consider the houses filled from end to end with well-grown plants of *Adiantum Farleyense* worth going a journey to see. Certainly, no other plant can equal this Fern for massing, so as to produce effects of almost cloud-like lightness.

New York.

R.

Shall we have an Orchid Society?

To the Editor of GARDEN AND FOREST:

Sir.—Cypripediums are grown more frequently in American collections than any other members of the Orchid family, and they bid fair to become as popular for decorative purposes here as they are in Europe. Their flowers show great variety in form and color, and have lasting qualities that are unequalled. Some Orchids are favorites at once, but the taste for Cypripediums seems to be an acquired one, and one that usually comes after experience with other Orchids. Nevertheless, they are already so popular, and the raising of seedlings has become so general, that questions of nomenclature have become important. If the present ratio of increase here in new varieties continues long, we certainly ought to have some authority recognized on this side of the Atlantic as competent to give certificates of merit and stability of names to such seedlings or hybrids as are worthy of perpetuating.

It seems to be unfair that our growers should be compelled to send material for such judgment to Kew, not only on ac-

count of the delay, but because of the difficulty in getting the material there in good condition. If we had an Orchid Society established here its certificates would add value to new plants raised here and give authority for naming them. Our growers of seedlings and hybridizers sometimes feel that they do not receive due credit for their work, and this would not be the case if such work were passed upon by a society of recognized rank, whose proceedings would be published, copied and spread abroad over all the civilized world. We should know little of the work done by amateur and professional cultivators in Europe were it not for the societies which give awards for this work, and these awards are, as a matter of course, published in horticultural periodicals. It seems evident that an Orchid Society here would do, to a certain extent, for American growers what similar organizations in Europe are doing for the producers of new and improved varieties in Cypripediums and other Orchids in Old World gardens.

South Lancaster, Mass.

E. O. Orpet.

The Forest.

The Consumption of Wood in the Comstock Mines.

IN no other group of mines in the world have such large quantities of timber and wood for fuel been used as in those on the Comstock lode. The Hon. William Alvord, of San Francisco, California, prepared a paper on the consumption of timber and wood in these mines for the meeting of the American Forestry Association in 1891, but the paper has never been published. The facts are so interesting, however, that we have asked Mr. Alvord to allow us to use such portions of it as would be most interesting to our readers.

The walls, ore bodies and, generally speaking, the entire formation of this lode are remarkable for want of firmness and tenacity. The friable nature of the ore, which renders its mining comparatively easy without blasting, except to fracture large masses, has a counter disadvantage in requiring an expensive and complete system of timbering in order to make its extraction safe. Again, some of the mines of this lode are, or have been, operated at a depth considerably exceeding 3,000 feet. However, the chief reason for using large quantities of timber is the great width of veins carrying high-grade ore. On the 1550 level of the Consolidated Virginia mine a vein 330 feet wide has been worked out clean, and in it and various other mines of the lode, veins ranging from 65 to 200 feet wide have been worked out in the same manner. The ore of the vein in the Consolidated Virginia, above referred to, furnished an average yield of \$126.00 in silver and gold to the ton. Such ore is too valuable to be utilized for chamber-walls as principal supports, as is done in most of the mines of the world.

The enormous pressure resulting from the weight of the overlying formation, augmented by the absence of the usual chamber-walls as principal supports, is sustained by an elaborate network of costly timbering, which has been admired for its completeness, safety and structural strength by many of the most skillful mining engineers of the civilized world. Without vast quantities of massive timbers to keep the walls in place, and corresponding quantities of wood to generate power for pumping out the water, hoisting the ores, reducing and amalgamating them and retorting at the mills, the great bulk of the precious metals which the Comstock mines have poured into the lap of nations would never have been discovered, and its extraction would have been practically impossible. The constant requisitions of the Comstock mines upon the mountain-forests have led to the christening of the lode as "The Tomb of the Sierras."

When the mines of the Comstock lode were discovered the surrounding mountains were sparsely covered with a growth of scrubby Pines, *Pinus edulis*, commonly known as the Piñon or Nut Pine, interspersed with a stunted variety of Red Cedar, *Juniperus Virginiana*. These woods were the most valuable of all for fuel, being hard, resinous and fine-grained, but were worthless for timbers and lumber, being too small. They supplied the wants of the mines during the prospecting and surface-mining eras and as long as fuel only was wanted, but as soon as any considerable depth was reached the supply was entirely exhausted, and the most easily accessible forests of the eastern slope of the Sierra Nevada were encroached upon, and ever since then the forest-line of these mountains has been pushed westward before the axe, until now it is west of the eastern crest of the Sierra range and almost on a line parallel

with the western shore of Lake Tahoe, and fairly within the limits of the state of California.

Timbers, lumber and wood have been chiefly supplied in late years to the Comstock mines from the southern portion of the Lake Tahoe basin, on the California side of the state line. The wood and logs are first transported about twelve miles by rail to the lake-shore at Bijou, the railroad extending over piles 1,700 feet out into the lake to a depth of water where the steamers and barges can moor alongside of the track. The wood is unloaded from the cars on barges, which have a carrying capacity of from 75 to 140 cords each. The logs are dumped from the cars into the lake and enclosed in boom-timbers, forming immense rafts, and then towed by powerful steamers to the eastern shore of the lake. At this point the logs are sawed into timbers and lumber, which, with the fire-wood, are reloaded on cars and transported up a long incline to the summit over another railroad about ten miles long. At the summit it is unloaded and is conveyed through a flume about twelve miles to the wood and lumber yards at Carson City, Nevada, and from there it is taken by rail twenty miles to the mines, making a total distance of sixty-five miles from the forest, over two rugged mountain chains. From the forest to the mines the timber, lumber and wood are necessarily handled thirteen times, but the arrangements are so methodical and complete that the whole system is operated with mechanical regularity and precision. The flume is V-shaped, with a carrying capacity of 600 cords of wood a day, and it will transport the heaviest mining timbers as well as lumber and cord-wood.

To the present time 120,000 acres of the Sierra Nevada's choicest forests around Lake Tahoe and 75,000 acres around the headwaters of the Carson River have been denuded to operate the mines. This area was practically all heavily timbered, and when it is considered that it equals an expanse of land three hundred and five miles long by one mile wide it will be apprehended that there is good reason for calling the Comstock "The Tomb of the Sierras."

From January 1st, 1880, to January 1st, 1891, 249,756,000 feet of timber and lumber were shipped to and used in and about the Comstock mines. During the same period, 100,776,440 cubic feet of wood were consumed, and to the latter amount should be added 11,264,000 cubic feet consumed by the Carson River mills, auxiliary to the mines, making a total of 875,316 cords. For the decade commencing January 1st, 1870, and ending January 1st, 1880, the timber, lumber and wood used cannot be ascertained with exactness, but a conservative estimate by men most familiar with the facts fixes the figures at 425,000,000 feet of timber and lumber and 268,800,000 cubic feet of wood, to which should be added 10,240,000 cubic feet used in and about Carson River mills.

A moderate estimate of the average price paid at the mines for timber and lumber since 1870 is twenty-three dollars a thousand feet and for wood ten dollars a cord, so that the Comstock mines since 1870 have used wood and timber to the total value of \$46,072,548.

The consumption of forest-products by the mines for the period between the discovery of the Comstock lode and 1870 can hardly be approximated, as there are no data for that time obtainable, but \$55,000,000 is probably a moderate estimate of the entire cost of timbers, lumber and wood used in and about the Comstock mines from the date of their discovery until the present time.

The seemingly endless labyrinths of timbers in the Comstock mines, when ignited and beyond control, make a subterranean fire which burns and smolders for years. Many lives have been lost in the mines by reason of these fires, but none are recorded as having been lost because of any inherent defect in the timbers or system of timbering. The size of the timbers used varies from the huge pieces sixteen inches square and twenty-four feet long, to the smaller pieces eight inches square, used in cribbing. The species used are chiefly Yellow Pine, *Pinus ponderosa*, Fir, *Picea magnifica*, and Cedar, *Thuya gigantea*, of which the latter is found in such small quantities as to be hardly worth considering. Fully two-thirds of the whole amount used is yellow pine, about one-third fir, and less than one per cent. is cedar. Yellow pine is a favorite timber with mine carpenters on account of its exactitude in joining. Cedar is inferior to no known timber, not even excepting Redwood, for its lasting qualities underground. Yellow pine has been taken from the lower levels of these mines so compacted by the enormous pressure it has withstood as to have a density and weight exceeding those of *Lignum-vitæ*, and has been made into paper-weights and other beautiful ornaments. None of the timbers in the Comstock mines have yet badly decayed, and their life there cannot be accurately determined. The heat and vapors of the

mines surcharged with mineral atoms appear to have a decidedly preservative effect upon the timbers.

The area upon which the forest has been cut off to supply the mines is now growing up, principally in Pine, but the second growth is so slow that it will require many years for it to attain a size sufficient for mining timber. The new growth is very thick, and on some of the lower slopes of the mountains where it is over twenty years old there are few trees ten inches in diameter, and the average diameter will not exceed six inches. In the Tahoe basin, which has been cut over principally within the last ten years, the young trees are about five feet high and will average about four inches in diameter. In the Sierra Nevada Fir predominates on the north slopes where the snow remains the longest and the sun shines the least. On the other slopes Pine largely predominates.

Recent Publications.

The Book of the Rose. By Rev. A. Foster-Melliar, M.A. Macmillan & Co., New York. 1894.

This title seems rather too ambitious in view of the fact that only certain classes of Roses are treated, and their cultivation for but a single purpose is described. The author does not consider the Rose as a decorative plant, its value, in his view, consisting solely in the perfection of its individual flowers. The single-flowered species are, therefore, dismissed with scant attention, since no one ever won a silver cup at a Rose-show with an individual flower of a single Rose. Half a dozen lines are given to *Rosa rugosa*, and one line to our Prairie Rose, *R. setigera*, which the author calls the Bramble-leaved Rose. This, and many others which he does not name, he declares have only a botanical interest, making no mention of so good a plant as *R. Wichuraiana* or of *R. lutea*, besides many other useful single Roses. The Sweetbrier, so long celebrated in English poetry, has secured brief mention, chiefly because Lord Penzance has been hybridizing the plant with the view of getting some double-flowered varieties, and the author is forced to grieve because these efforts have been only partially successful, semi-double varieties alone having been obtained. From all this it will be seen that the book is prepared chiefly for enthusiasts who cultivate Roses for the purpose of securing exhibition flowers, and for such specialists it will afford the keenest pleasure.

The book opens with the usual chapters on the history and classification of the Rose, which tell nothing particularly new, and these are followed by notes on soil and situation, laying out of beds, fertilizing, pruning, stocks, propagating, etc., with directions which are mostly adapted to the English climate, and are, therefore, not very useful to Americans. Nor will American readers find much assistance in the chapter on Roses under Glass, because our own growers excel their English brethren in this matter, although it is by no means possible to raise such beautiful roses here in the open air as can be done in England. The chapter on Exhibiting is most interesting. We can hardly expect that Rose-shows will be such important events in this country as they have been in England; nevertheless one cannot but admire the wonderful care and pains which are taken in order to present the individual flowers, if not exactly at their best, at least in such a condition that they will be considered best by the judges who have an ideal of their own. We are told how to remove the buds, and which buds are to be chosen, if we are to secure the coveted prize; why different treatment should be accorded to different varieties in order to prevent some flowers from becoming too coarse or too full, or from being too long in opening; why some varieties should only have one bud on a single stem, and what precaution should be taken in such cases to prevent malformation; how "protectors" should be prepared and when they should be removed; why and when the buds should be shaded; how to paper and dress them, and how to exercise generalship and legitimate maneuvering for the last hour before the judges enter—all this is told with great skill and knowledge, and is certainly very amusing, and is instructive, too, in

showing what can be done to make a flower perfect, according to any given standard, by persistent and intelligent care.

The part of the book which will be of the greatest use to American readers, however, is the chapter entitled *Manners and Customs*, which, in a thorough way, makes mention of the peculiarities of habit, general appearance and behavior, under different circumstances, of the best-known varieties. The list is not complete like the admirable one in Mr. Ellwanger's book, but the descriptions of the varieties which are named are much more minute, and all the drawbacks, as well as the good qualities of the show-varieties, are noted. The demerits and bad habits of each are pointed out just as their good qualities are, and besides the peculiar ways which mark different groups or families, the "manners" of individual varieties are set forth so thoroughly that one feels sure that the author is familiarly acquainted with all of them and that he writes out of abundant personal experience. The book is illustrated with several half-tone plates, and many of them really help the text. They are not as well executed as American half-tone work usually is, although some of them show admirably the texture of the leaf and the shading of the petal. Perhaps the judge of an English Rose-show would like the prize plant whose illustration fronts page 181, and certainly it shows the highest cultural skill. Persons who prefer Chrysanthemums tied and staked into a perfectly globular form, and with flowers appearing at equal distances all over the surface, will probably like this Rose much better than one naturally grown. The reverend author tells us that it will often take a man three days to tie and wire one of these big plants into the shape of a pyramid, globe or cone. Sometimes they are trained with a flat back and without any growth on that side, and these one-sided plants, according to the author, look well where the pots are stood up against the wall.

Notes.

Mr. J. H. Hale writes to the *Florists' Exchange* that a single nursery company in Georgia has planted a hundred bushels of native chestnuts, which are now in nursery rows simply to produce seedling stock upon which to graft cions of Burbank's new Sweet Chestnut. The company has contracted to propagate a half a million trees.

At a recent exhibition in Holland, Mr. J. H. Schober exhibited fruiting branches of fifty-two species of Conifers grown in his pinetum at Schovenhorst (Patten), on ground which less than fifty years ago was a barren moor. In a catalogue of the Pinetum Schoberianum, published in 1892, one hundred and ninety-nine species and varieties of coniferous plants are enumerated.

Professor Webster, of the Ohio Experiment Station, has been making experiments to determine whether honey-bees are injured by spraying fruit-trees with the arsenites while they are in bloom. These tests seem to show conclusively that bees are killed in this way. Apart from the destruction of the bees and the consequent loss to the apiarist, this would seem to be a bad policy for the fruit-grower, since the presence of bees is acknowledged to be of great value in securing a crop of fruit by their work in pollinating the flowers.

No species of Orchid as important as the beautiful *Cypripedium Charlesworthii* was introduced in quantity during the year 1894, but one new genus has been described, coming from the Andes, and forty new species. Two remarkable natural hybrids have appeared, with many striking varieties of natural hybrids already known. The *Orchid Review* gives a list of between fifty and sixty hybrids which are considered sufficiently important to put on record as having flowers for the first time during the year, and, of course, there are many more which can in no way be considered as improvements on existing varieties.

Unlike bananas, which are usually eaten as a dessert fruit, plantains, as is well known, are unpalatable unless roasted or boiled. It is not generally known, however, that the inner undeveloped leaves and the flower-buds of the Plantain are often boiled and eaten like cabbage and made into a curry. A palatable drink is made by covering crushed ripe bananas or

plantains with water and allowing the mixture to stand for a few days until it ferments. Since Bananas and Plantains are singularly free from diseases, there is, no doubt, a promising future for their cultivation, as the uses of both for various purposes are largely on the increase. Bananas are now preserved, canned and dried, and both bananas and plantains, when dried and ground, make a meal which is highly palatable and nutritious.

A leguminous evergreen climber, with flowers a foot across, whose petals are pure white, of a tissue-like texture, with a narrow fringe on the edges like gold lace, would certainly present a magnificent spectacle when in full bloom. On page 103 of our last volume, *Camoënsia maxima*, a tropical African climber, was described by Mr. Watson as bearing such flowers, and although the plant is not new, and many large specimens are found in European glass-houses, it was said that no one as yet had succeeded in flowering it. It was stated also that a plant sent from Kew to Ceylon ten years ago was now flowering with great vigor in the famous botanical gardens of that island, and it has also flowered in the botanical gardens of Trinidad. From the *Kew Bulletin* we now learn that Mr. W. Mackie, gardener to Mrs. Ruddle, of Tewkesbury, England, has at last flowered the plant successfully. No doubt, as its habits become better known these beautiful flowers will be seen more frequently. It has been suggested with great probability that the plant loves bright sunlight and a good deal of it, so that one would think it a promising subject for some of the large collections in this country.

The established fact that leguminous plants are able to gather a portion of the nitrogen they need for food, either directly or indirectly, from the free nitrogen of the air, suggests that it may be worth while to investigate the foraging powers of different plants for other nutrients. Every one knows that in any given soil different plants are grown with different degrees of success, and it seems quite likely that some plants are able to use certain compounds of potash or phosphoric acid in the soil which are not so readily available to others, just as leguminous plants can obtain nitrogen from sources that are not available to the Grasses. Some tests were made at the Maine Experiment Station last year to ascertain the capability of different plants to appropriate phosphoric acid, and they seem to indicate that Wheat, Barley, Corn, Peas, and especially Turnips, can secure this food from crude, finely ground South Carolina rock with greater or less ease, while Beans and Potatoes derive no benefit from it. Of course, definite conclusions can hardly be drawn from one year's work, but these investigations are being continued. It would be a distinct gain to horticulture and agriculture if it could be known in what particular form each particular plant preferred to have its food.

Owing to the unexampled destruction in Florida from the late freezing weather half-rates were allowed to shippers by transportation companies until the 16th of January, so that seventeen and a half cents covered the freight on a box of oranges from Jacksonville to New York. This low charge induced large shipments, and whereas but 12,000 boxes of Florida oranges reached New York during the first week after the crop had been frozen, nearly 60,000 boxes arrived last week. Prices have ranged from fifteen cents to \$1.00 a box for frosted fruit, \$5.00 being asked for choice oranges gathered before the frost. Grape-fruit seems to have been more severely injured even than oranges and has been selling slowly at the nominal price of fifty to seventy-five cents a box, while Tangerine oranges seem to be the least affected and sell at \$1.50 to \$2.00. Jamaica oranges now command \$5.50 to \$6.00 a barrel at the steamer's side. Havana Strawberry pineapples range from \$3.00 to \$12.00 a hundred, and Aspinwall bananas cost \$1.12½ a bunch by the truck-load. English hot-house grapes have advanced in price with the scarcity of Almeria and other sorts, and Gros Colmans bring \$3.50 a pound. Large Easter Beurre pears cost \$1.00 a dozen. The highest grade of cranberries is quoted at the unusual price of \$14.00 a barrel, retail dealers asking twenty cents a quart. Florida cucumbers, cauliflower, chicory, egg-plants, peas and string beans, which a month ago were in regular supply, have been cut short by the frost, and the standard winter vegetables will have to be depended upon for some weeks to come. Some tomatoes from as far south as Key West bring thirty cents a pound for the best, and tomatoes from Cuba cost the same price. Other vegetables now coming from Cuba are onions, okra and peppers, and small supplies of well-blanch'd Romaine lettuce are now imported from Bermuda. Bermuda potatoes cost \$7.50 a barrel, and cabbage from Denmark \$6.00 a hundred.

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLE: —Legislation against Plant Pests	41
An Old Bridge and a Long-lapsed Thoroughfare in Massachusetts. (With figure.)	42
Gardening a Good Outlet for American Vitality	42
PLANT NOTES	44
NEW OR LITTLE-KNOWN PLANTS: —A Monstrous form of the Black Spruce. (With figure.)	44
CULTURAL DEPARTMENT: —A few Good Shrubs of the Hardest Type. <i>J. G. Jack.</i>	45
Vegetable Garden Notes. <i>W. N. Craig.</i>	46
Propagation of Chrysanthemums. <i>T. D. H.</i>	46
A Few Plants that Like Shade. <i>F. H. H.</i>	47
MEETINGS OF SOCIETIES: —Nebraska State Horticultural Society	47
Western New York Horticultural Society	48
RECENT PUBLICATIONS	49
NOTES	50
ILLUSTRATIONS: —An Old Bridge in Wrentham, Massachusetts, Fig. 6	43
A Monstrous Form of the Black Spruce, Fig. 7	45

Legislation against Plant Pests.

In the month of May, 1894, a resolution was passed by the Legislature of Massachusetts requesting the Representatives and Senators from that state in Congress to use their influence in securing from the Federal Government an appropriation of \$100,000 to assist the commonwealth of Massachusetts in exterminating the gypsy moth. A committee appointed by the Massachusetts Board of Agriculture has visited Washington in pursuance of this resolution, and, as we understand it, the matter is now regularly before the Congress of the United States. Really, this is not a new movement, for the effort to secure this appropriation is simply a renewal of what was tried last year. There is little probability, however, that any action will be taken in this matter at the national capital, although that section of the Constitution which authorizes Congress "to provide for the common defense and general welfare of the United States" has often been interpreted with great liberality. We can all remember when Congress authorized agents of the Department of Agriculture to enter upon private premises and slaughter animals which were adjudged to have pleuro-pneumonia, and then paid the owner what they pleased. The general welfare seemed to demand that our herds should be guarded against this danger, and, as a matter of fact, pleuro-pneumonia was utterly stamped out.

Few persons now believe, however, that it is practicable to exterminate the gypsy moth. The state commission, which has been fighting it, have undoubtedly done much to prevent its spread and have narrowed the territory over which it once extended. But this moth is so prolific and so indifferent as to what it feeds upon that its actual extinction, now that it has gained a foothold, seems out of the question. It may be true that if the insect is allowed to multiply unchecked it will overspread a large portion of the country, and in this way prove a national calamity, but the machinery for restraining it has now been so thoroughly organized that a comparatively small force of men employed as watchers in districts that have not been entirely cleared can control and gradually lessen its ravages. The western states will not be inclined to spend money to protect themselves from a danger so remote, and will probably suggest that Massachusetts should take care of her own insects.

This is certainly a wholesome rule. In this particular instance it may be a special hardship for Massachusetts, but there are many other insects quite as destructive, and there are fungous diseases even more serious, and if this state or other states should once discover that national aid was easy to obtain they would do nothing for themselves, but trust to general welfare appropriations altogether.

It will never answer, on the other hand, to make light of the dangers and damage which come from insects, fungi and other foes of agriculture and horticulture as not worth considering by legislatures, state and national. If, as it has been estimated, this damage amounts in the country to half a billion dollars a year, or say a million and a half of money every day, there are few subjects of greater economic importance. It must be admitted, too, that these losses can in no way be checked without coöperation of some kind, and organized effort usually comes in the form of law. It is worse than discouraging for a man to spend time and money in ridding his Apple orchards of the tent caterpillar, or his Plum-trees of the black knot, when his neighbor allows both insect and fungus to multiply on trees on adjacent land. It does not seem unreasonable, then, in cases for which there are known remedies, that landholders should be held responsible for their own premises, and that when these premises are allowed to become hot-beds of pestilence and breeding-grounds of injurious insects, the representatives of the people should step in and clean out these plague spots at the expense of their owner. Laws which authorize the destruction of Peach-trees affected by the yellows have already been passed in Michigan, Delaware, New York and California, and in New Jersey the officers of the state experiment station are empowered to enter on lands where plants are infested with any new fungus and destroy the same by fire or otherwise as they shall deem best. In one of the north-western states a law was passed to compel farmers to plow over lands where the Rocky Mountain locusts had laid their eggs, to prevent injury the following year, and it provided for having this work done by the state where the landowners neglected it.

In fact, it is not difficult to draft laws to protect every careful farmer and fruit-grower from noxious insects and diseases which are bred on the grounds of careless neighbors. The trouble is that the public sentiment behind these laws is not, in many cases, sufficiently active and vigilant to enforce them. So far as we know, the law in New Jersey, which was aimed at a new Cranberry fungus, has never been put into execution. Almost every state has a statute against permitting the Canada Thistle to go to seed, and yet how many persons have ever been prosecuted for such negligence? The very classes most interested in the extermination of the Peach yellows and the black knot have often combined to defeat legal action, and the farmers whose lands were plowed over to destroy the locusts prosecuted the state officers for trespass. Nevertheless, just as fast as communities are educated up to the enforcement of them, such laws ought to be enacted. Everybody in eastern Massachusetts, for example, ought to know the tent caterpillar and the cankerworm, and ought to realize what their unchecked ravages mean. It would seem that the time has come in some states, at least, when public opinion ought to be sufficiently strong to enforce a law compelling every man to keep his land cleared of these pests. Other insects will doubtless prove quite as injurious at some future time, and, therefore, such a law may well be broadened out to give the state entomologist authority to warn landholders of the importation of any new insect, or of the appearance in alarming numbers of any that are well known.

One difficulty is that people do not know their foes when they arrive. The gypsy moth itself would not have gone on increasing for several years before it was discovered unless it had started in a region where the cankerworm defoliated every year a large portion of the trees, and the inhabitants had become

so accustomed to seeing injuries of this sort that they never thought of examining one of the marauders to see what it looked like. Pear-trees have been dying for half a dozen years in Essex and Union counties, New Jersey, and it was not until last year that one out of the scores of men who saw their orchards wasting away thought of sending one of the destructive borers to the experiment station to be identified. The wood leopard moth must have been ravaging the shade-trees of the city of New York, Jersey City and Newark for years before the year 1887, when the first specimen was accidentally found in a spider's web, and yet there are more collectors of insects in this one region than in any other portion of the United States. The story of the pear midge and the red-necked blackberry borer has been told in these columns more than once, and we have given examples of other insects and diseases whose ravages at the first could have been arrested by the prompt action of some one in authority, but which have gone on conquering without check until they are almost hopelessly beyond control.

Experience has amply shown that many of the most disastrous outbreaks of our insect enemies could have been easily quelled at the outset. To meet such emergencies it is necessary that the machinery for repressing them should always be ready. There should not only be enactments authorizing constituted authorities to enter the field at once, but means and penalties should be provided to insure the enforcement of the law. As the knowledge of insects and their ways is necessarily limited, these means of precaution and suppression should be always in the charge of skilled entomologists. More than all, every known method of popular education should be employed through the press, through farmers' institutes, through the agricultural colleges and experiment stations, and through the public schools, if need be, to instruct the people as to the magnitude of the loss which these enemies to plants may cause, so that the officers whose duty it is to act will have the moral support of the entire community.

An Old Bridge and a Long-lapsed Thoroughfare in Massachusetts.

NOT long ago a Boston paper contained an account of the old Indian trail which led between Boston and Plymouth, and which was, for a considerable period, the thoroughfare between the capitals of the two leading New England colonies. This old trail traverses from one border to the other Boston's fine Franklin Park, and for a considerable distance its course may still be traced, though the improvement of the park has, to a certain extent, obliterated it. The claim that this old path is the Indian trail to Plymouth evidently rests upon traditions in the families who have owned land in this neighborhood from the period of the first settlement, and it is undoubtedly very good evidence, as far as it goes.

These early trails and roads are a very interesting feature of many eastern towns, and should be, for that matter, of western towns as well. Many of them, of course, have developed into modern thoroughfares, and have thus lost their interest as relics of the past. In many cases, however, the exigencies of modern traffic have caused the construction of entirely new roads, and left the old thoroughfares to lapse, first into cart-roads and then into footpaths, and at last, no doubt, to be almost totally obliterated by up-springing woods. But it is astonishing how long an old road may be traced through the woods, even after every sign of human interest in it has been lost.

In the old town of Wrentham, Massachusetts—a place saturated with traditions of King Philip's war, and where the stump of an old Oak is pointed out as the tree in which the famous Indian chieftain successfully concealed himself when the whites were pursuing him—there is a beautiful and most interesting old stone bridge which now serves to carry across Mill Brook a path leading from a dwelling-house to a spring. No road whatever now crosses this

solid old arch; but the path which goes over it bears many signs of having once been a thoroughfare. It leads from a locality now called Glenwood, where there is a lonely shoddy-mill, to a locally famous ledge called Indian Rock. Here there is very good evidence that a band of thirty Indians who had participated in the Medfield massacre were waylaid and slain by the whites during Philip's war.

The old bridge is shown in the accompanying illustration (see page 43), and is from a photograph taken in the summer of 1894 by Miss Helen Chamberlin. It is built wholly of a slate-like stone, which now possesses a beautiful purplish tint. It has a covering of turf; it is almost completely overgrown with a luxuriant mass of mingled Poison Ivy and Virginia Creeper, and the stream beneath it, which just above issues from Whiting Pond to join the Charles several miles lower down, is here choked with all manner of water-plants. The region about it is an utterly wild one—scarcely tamed at all by the shabby and solitary little shoddy-mill which stands near. No one about the neighborhood seems to know the history of the bridge. It is certainly extremely old; it must have taken a great deal of toil to build it; and manifestly it once carried a thoroughfare over the little river.

Gardening a Good Outlet for American Vitality.

IT is sometimes asked why there is so much more interest taken by the English clergy and country gentlemen in gardening than is manifested by the corresponding class in the United States. Why is it that in our country parishes we do not find that enthusiasm which has given us so many charming books about gardens from reverend gentlemen in England who have rendered practical service to floriculture? It was to the experiments of the Honorable and Reverend William Herbert, in 1836, that we owe some of our earliest knowledge in hybridization. Indeed, his efforts were so coolly received by contemporary botanists that he complains that their answer to his curious specimens was "we do not thank you for your mules." We have an attractive picture of Sydney Smith working to beautify the grounds about his various forlorn rectories. And who does not relish his practical joke in honor of a coming guest, for whom he made the parody of a park in his domain by tying oranges to the glossy leaved shrubs in the garden, and fastening horns to the two donkeys peacefully grazing on his tiny lawn that they might play the part of deer?

The Reverend Charles Kingsley made quite a little paradise out of a damp and most unpromising situation at Eversley. He drained ponds, and planted and beautified; turned a wretched chicken-yard into a grassy court bordered with flower-beds, and trained Roses, scarlet Honeysuckles and Virginia Creepers to climb over the wall between the house and stables. His borders were always gay with Phloxes, Larkspurs, Pinks, Pansies, Roses and Carnations, and his rare trees and blossoming vines afforded him great delight, and transformed a neglected spot into a charming garden. We all know how enthusiastically Dean Hole has worked to interest the British public in flower-shows, and what his single efforts have done for the development of floriculture all over England; and these well-known names are only a few among many who have taken, and still take, the keenest interest in this beautiful pursuit, and find in it their solace and delight.

Of course, the English rector or vicar has a peace of spirit from the permanence of his position which the American clergyman, dependent upon his popularity with an exigent congregation, cannot enjoy. The calm superiority of district visiting is quite another thing from the weary social duties of a country parson in a Yankee village; but there must be something besides this to explain why more ministers here do not put their spare time into their gardens, and so gain at once health and enjoyment by wholesome labor.

The climate, of course, goes for a great deal, for Eng-

land's damp, mild atmosphere keeps one, perforce, upon the go, and apparently there are few months in the year when a man cannot work comfortably in his garden and find something to reward his efforts. There roses are to be found until Christmas, unnipped by frost, and Thorns are known to bloom in midwinter. Mrs. Boyle, in *Days and Hours in a Garden*, tells how she cut a long spray, all wreathed in pearly bloom, on New Year's Eve from the Glastonbury Thorn at Marston Bigot, in Somersetshire. In that mild climate Daisies bloom in January, and Hepaticas and Violets are found on warm and mossy banks. Primroses, apparently, never fade in Mrs. Boyle's garden, and Iris ensata ventures to appear in February. Daffodils take the winds of March with beauty, but are preceded by the Snowdrop, the Crocus and the Polyanthus, and accompanied by the Kerria-buds and pink tints upon the Peach-trees.

Such things are rare with us so early, north of Washington, and one can realize how under such circumstances the garden in England becomes a constant wooer which ever encourages and recompenses its votaries.

In England the rich man enjoys his garden, plans it, expresses himself in it. Agriculture and forestry are a part of his business in life. He is, and must be, a husbandman in a large sense, must understand the details of his estate, and give personal consent to the cutting of timber. Here the wealthy owner of a place often takes no more interest in it than in the sidewalk in front of his town house. A glance shows him that it is clean and well swept, and that is all he wants to know. The detail is left to the gardener, and his ideas, not those of the proprietor, are expressed in the grounds. The effect of this is that a man's culture, his fine taste, his trained critical perception go for nothing in his surroundings, and a general dead level of uniformity ensues, with a few notable exceptions where some one takes the matter into his own hands and produces a definite and interesting result which bears the traces of thought and individual experience.

It would be a good thing for us if the country gentleman could be revived with his traditional interest in his lands and crops; and it is possible that the new impulse to re-



Fig. 6.—An Old Bridge in Wrentham, Massachusetts.—See page 42.

There is another reason, too, why folk walk abroad in the little island more than they do here, which has been noted by Mr. Edward Freeman in the *Fortnightly Review*, and Mr. Price Collier recently in the *Forum*. The American loves reading more than the Englishman, and the garden finds a rival in the library. Both these writers note that while there are more profound scholars in England, the "general reader" exists in far greater numbers on this side of the Atlantic. The Yankee is nothing if not well smattered, and his newspapers are a day's work in themselves. Moreover, his head is apt to be full of all manner of things which conflict with the serene pleasures of digging and weeding. Business, politics, all sorts of duties, intervene; he spends his life in one perpetual strain, driven by the whirling temperament within him; by the maddening climate without; by the infinite unrest of a seething civilization which boils about him, and by that impulse to get ahead which tethers him to an office desk, and is at once his glory and his shame.

main late in the country is an evidence that the tide is setting that way, and that the coming century, among its other developments, will witness a growth in personal interest in country places. Every one who has once tasted the real delights of gardening returns to it with zest. Tranquilly pursued it gives a certain richness to life and thought, a wholesome basis for intellectual labor. It is a common bond between the wise and the ignorant, a pursuit wherein men of different station can interchange rôles and mutually impart knowledge. Rivalry here is of the friendliest; the cottager's Rose may surpass that of a duke, and the interest of one in his specimen be as keen as that of the other.

If there is one more noticeable fact than another about Americans it is the lack of deep root in the soil. We have not the strong local attachment which comes with a long family history connected with a family estate. Everybody goes west, or somewhere else, instead of maturing on the ancestral acres, so that home is not so much a spot to grow fast to as to move away from, and no one builds gardens

for strangers who are soon to occupy his place. Nevertheless, the remarkable increase in the culture and sale of plants during the last fifteen years is an unmistakable evidence that we are a plant-loving people; but so far the development is more among nurserymen and florists than in individual interest of home-makers. That is, it goes more by fashion than by personal taste, but many important movements have grown out of fashions, and the proprietor who buys because his neighbor does, gradually comes to look with interest upon his plantations and flower-beds, and in time will come to know something about them and to derive benefit from them.

Beyond any question, a more general devotion to gardening among Americans would help them to lead lives of greater serenity and sanity. They could afford to read fewer books and newspapers if they only learned these lessons of peace which come from contact with nature. It would be a solace to poor and rich. It would cultivate the taste and gratify the love of beauty in many a home where costly works of art are not to be thought of. And is it not also true that the wholesome recreation in the open air would be especially beneficial to the men and women who are devoted to literary work? To return to the clergy once more, would it not be wise for them to take a leaf from the book of their British brethren for their own enjoyment and health, as well as for the effect upon their sermons. There is no better outlet for nervous irritability produced by brain work than out-of-door struggles with reluctant nature and her six-footed armies. If we are to have a vigorous literature we must have hearty men behind it; therefore it is to be hoped that the literary man of the future will feel himself not fully equipped for his profession unless he be the owner of a few square feet of garden soil from which he may derive mental vigor with bodily wholesomeness.

M. C. R.

Hingham, Mass.

Plant Notes.

FONTANESIA FORTUNEI.—Mr. John Dunbar, the Superintendent of Highland Park, Rochester, New York, calls our attention to the fact that *Fontanesia Fortunei* is hardy and a desirable ornamental shrub in Rochester if it is carefully mulched in winter. It is a plant of the Olive family, with slender graceful branches covered with deep green leaves, which do not fall until late in the season. The greenish or creamy yellow flowers, which are crowded in the axils of the leaves, are interesting rather than conspicuous. *F. Fortunei*, which was introduced from China a few years ago, is only known there in the neighborhood of Shanghai, where it is often planted in hedges. Botanists now consider this plant identical with *F. phyllyreoides* of the Mediterranean Basin and Asia Minor, and it has been suggested that it had been introduced into China from southern Europe or the Levant. Mr. Dunbar, however, finds that *F. phyllyreoides* grows less freely and does not flower in Rochester.

NARCISSUS BULBOCODIUM MONOPHYLLUS.—This delightful little Hoop-petticoat Daffodil was brought into English gardens more than twenty years ago, but was for a long time rare in cultivation, and was supposed to be difficult to manage. It is a native of Algeria, where it is found in great abundance, and if the bulbs are kept dry and baked in full sunshine all summer as they are at home, they need no other special attention. It is said that newly imported bulbs flower in England in December, but here, at least, after a year's cultivation, this is the natural season of flowering, and Mr. Gerard now has these Daffodils in full beauty in a cool house, where they have grown without any forcing. The delicate flowers are snowy white, with orange-colored anthers, and a panful of the plants in full bloom makes a very pretty show. The corona is bell-shaped, and it has the small perianth sections peculiar to the species. The flowers have a fragrance which is even heavier than that of the Paper-white Narcissus, and which is not pleasing to

every one. A figure of the plant is to be found in vol. v., page 211. Professor Foster has raised an interesting and pretty hybrid between *N. triandrus* and this plant, which is said to combine the charm of both of its parents, with a sturdier constitution than the variety *monophyllus*. The flower-scapes of this new plant, which he named *Narcissus Trimoni*, by combining the first syllables of the specific names of its parents, are nine inches long, usually two-flowered, each flower being two inches across. The whole flower is milk-white.

BRODIEA (TRITELEIA) UNIFLORA.—Although this little bulbous plant comes from Argentina, it is hardy in our eastern states, and it bears in late spring single star-shaped flowers on slender stalks above the narrow leaves, which are about one-eighth of an inch wide and six inches long. If the bulbs are planted in the grass and the foliage is not cut until it ripens, the plants will bloom freely year after year in the sod, where the delicate lilac-colored flowers are seen to the best advantage. There is a pure white variety which is quite as hardy and more beautiful. We mention the plant now, however, on account of its value for flowering in pots in winter, for it can easily be had at this season, and the flowers last a long time. The bulbs should be planted in September, and need nothing beyond ordinary treatment, that is, good soil, free drainage and liberal water when growing. A dozen bulbs can be planted to advantage in a six-inch pot set in a cool, shaded frame, with fresh air every day and protection from severe frost. They can be brought into a sunny greenhouse as needed, and will develop rapidly and bloom in about two weeks. After flowering they should have a complete rest, that is, they should be totally deprived of water, dried off and repotted in the fall. Or they may remain in the same pot or pan several years if a top-dressing is given every autumn. There is an objectionable garlic odor to this plant when any part of it is bruised, but the flowers themselves have a faint fragrance which is not unpleasant.

New or Little-known Plants.

A Monstrous Form of the Black Spruce.

THE most curious, and certainly not the most beautiful of all conifers found in gardens is that form of the Norway Spruce, with long whip-like branches, usually called *Picea monstrosa*, and occasionally found in collections of these trees, always exciting much interest and astonishment.

Three years ago a variety of the native Black Spruce, *Picea Mariana*, of the same character was discovered by Mr. George Walker on his "Forest Dale" farm, near Williams-town, at the north-eastern base of Mount Hopkins, and 1,175 feet above the level of the ocean, about three miles from the north-western corner of Massachusetts, and one mile east of the New York boundary. When first noticed by Mr. Walker the tree was about five feet high to the top of the leading shoot, and is now eight and a half or nine feet high, its average annual growth being ten to eleven inches. The side branches are horizontal and prostrate on the ground, while the upper ones have a tendency to twine around the central stem. The peculiar habit of this tree is interesting as showing remarkable seminal variation in a tree which has been considered less inclined to vary than the Old World *Picea excelsa*, and is well shown in our illustration on page 45 of this issue, made from a photograph for which we are indebted to the courtesy of Mr. Alexander Walker, of Williamstown. Like other seedling varieties of conifers, Mr. Walker's Spruce can, of course, be propagated by grafting the ends of the branches on to seedling Spruce-trees; and it is sure to find its way into cultivation, when it will make a good companion to the numerous varieties of the Norway Spruce which delight the lovers of such plants.

Cultural Department.

A few Good Shrubs of the Hardest Type.

OWNERS of gardens in central and southern New England and New York, and other regions with corresponding conditions of climate, enjoy the advantage of being able to

winter, sheltered and peculiarly favorable localities are sometimes found where certain plants will grow satisfactorily which will not endure in most positions in the surrounding country. So many costly experiments have been made by private individuals that we now have a fair idea of the powers of endurance of most of the trees and shrubs generally known in cultivation. Exotic ornamental shrubbery has received less



Fig. 7.—A Monstrous Form of the Black Spruce.—See page 44.

grow a much larger variety of fruit and ornamental trees and shrubs with less trouble than is possible in cold exposures farther north and in higher altitudes, and especially in the cold dry regions of the north-west. Here and there throughout the colder regions, where the mercury occasionally falls to twenty-five or thirty or more degrees below zero of Fahrenheit every

attention than most other branches, but within a few years a much wider interest has been shown in this class of plants, and the work of testing and disseminating them has been fostered by some of the agricultural experiment stations. In future we may see some other shrubs as well known and commonly planted about bleak farm-houses as the common Lilac,

which now seems so much a part of the country that few people ever think of it as an exotic. It is a universal favorite, and its success is due quite as much to its easy propagation, thorough hardiness and general take-care-of-itself character as for its beautiful flowers. The plants requiring the least attention and care are the ones which will survive in the average farmer's garden. Grown from cuttings, and so on their own roots, some of the improved varieties should become popular, as they are apparently quite as hardy as the old forms. Tartarian Honeysuckles, *Lonicera Tartarica*, of several variations are extremely hardy, and the common Snowball, or sterile form of *Viburnum Opulus*, endures cold winters without protection, and is, therefore, popular. These three kinds of plants and a few Roses are the best known in many districts where nurseries are rare and variety is limited. But to these could be added many more which are thoroughly hardy in most trying situations, which are easily propagated, and which require little care after being once well started.

It should not be forgotten that some of the native local shrubs are among the hardest, and are often quite as beautiful or useful as any of similar kinds that might be purchased. Among these natives are Roses, Spiræas, Honeysuckles, Viburnums, etc. Among enduring foreign shrubs for bleak and exposed situations the *Caragana*, or Siberian Pea-trees, take foremost rank. They may be propagated with great facility by seeds. *Caragana arborescens* is the largest, sometimes growing fifteen or twenty feet high. In the Russian steppes it is said to be greatly used for hedges and screens in the most exposed places. Several other species of *Caragana* are equally hardy, but none of them grow so large as *C. arborescens*, and none are more valuable, although the persistent spiny leaf-stalks of such species as *C. spinosa* make them curious objects and suggest their value as low hedge plants. All have clear, yellow-colored pea-shaped flowers. Almost equally hardy, and much more showy, are the Mock-oranges, or species of *Philadelphus*, by a great many people called "Syringa." They are not so common as the Lilac, although the plant propagates itself very freely by seeds. Although the Mock-oranges are very hardy, their close allies, the Deutzias, are not able to stand in the same situations without suffering much injury.

The great-flowered *Hydrangea paniculata grandiflora* is valuable for its great hardiness and is likely to do well in many parts of the north-western plains, where few showy shrubs thrive.

Rosa rugosa, both the white and pink flowered varieties, is now well known for its extraordinary endurance, and it represents the hardest of its class in cultivation. It will stand without protection where almost all other kinds will fail, and from its cultivation and improvement we must look for the Roses which will take the place of present garden varieties for planting in those parts of the country where the climate is most severe.

Arnold Arboretum.

J. G. Jack.

Vegetable Garden Notes.

THE winter thus far has been a comparatively mild one; the temperature has not on a single occasion fallen to zero here, and there has been but little snow. It is somewhat unusual to see plowing, digging and planting operations in this section during the first week of January, but the ground was quite free from frost and in fairly good working order at that time. Although we prefer to manure and dig over in the fall all soil in which vegetables are to be planted, we never are able to complete this work for want of time. During dry frosty weather we had manure wheeled on ground still to be turned over, and deposited in good-sized heaps. When open weather sets in this manure can easily be spread, and there is then no necessity for wheeling through the soft ground with the barrow-wheels half-buried.

It is unlikely that any suitable weather for outdoor work will occur for six weeks. As soon as this change comes any necessary draining ought to be attended to. If drainage has been neglected in the formation of the garden, as is very often the case, no time should be lost in seeing to it. A regular plan of all drains should be kept, and any alterations or additions accurately noted. This will prevent much confusion at any time when it may be thought necessary to alter or repair the drains. Garden-tools of all kinds should be cleaned and repaired. Attention to these matters in season will save both time and expense when the tools are needed for use. Nothing so much shows the want of system on a place as an ill-kept tool-house, and yet this often looks like a useless lumber-shed. Gardeners should see that every man under their charge on quitting his daily work carries such tools as he has been using to the tool-house, cleans them properly, and puts them

in place. There is no more slovenly habit than for a workman to lay down his tools coated with manure or earth, and a man who is neglectful of these minor duties will never make a neat gardener. At this season it is well to look over the cellar or storehouse where onions, potatoes and other vegetables are kept, and remove decaying roots. Potatoes will probably need to have some sprouts rubbed off if they have been stored in an overwarm place. Celery, whether in cellars, frames or the open ground, should not be neglected. Air should be admitted on every favorable opportunity to prevent the spreading of mold. Celery has not kept as well as usual here this season. The heavy snowfall early in November and subsequent frosts destroyed many thousands of good plants. Much of the crop was frozen solid, and even such as had been earthed up had the tips badly nipped. The kinds which have kept best with us are Kalamazoo and Giant Paschal, the first named being the most satisfactory.

We usually make our first hot-bed for Lettuce early in January, and from this we get good heads in six weeks' time. We have had no difficulty in providing a supply of lettuce throughout the winter by attending to the frames carefully, and making a hot-bed once a fortnight. A gentle bottom-heat is all that is required, and we mix stable-manure and leaves in about equal proportions for the beds. If at all dry, the manure should be watered and the whole tramped down firmly. When properly made, a hot-bed will maintain a gentle heat for a long time. Too often a quantity of rank straw-manure is thrown into a frame and not mixed or shaken up at all; the result is a violent heat for a few days, which will burn the roots of any unfortunate plants which may chance to be planted over it. For forcing purposes we find White Tennis-ball still the most reliable Lettuce. Radishes of the turnip-rooted class, if sown or pricked in between the Lettuce rows, will come along very quickly. If no hot-bed is at command and a supply of Radishes is desired, excellent ones may be had by pricking them off into boxes of rich compost and placing them on a shelf in the greenhouse. Sowings of Beet and Lettuce should now be made, to be transferred to a gentle hot-bed when large enough to handle. Cauliflower and Cabbage ought also to be started in a cold house without delay, and a few small pots of Parsley ought not to be omitted. About the middle of February we sow a batch of Golden Self-blanching Celery for an early supply; there is always a likelihood of a percentage of these early-sown plants running to seed, more particularly if the plants suffer from lack of moisture at the root. If extra-sized Onions are desired, this is a good time to make a sowing of Giant Rocca, Silver King or Prizetaker; by pricking these outdoors, bulbs can be obtained double the size of those sown in the ordinary way. All varieties of Onions, by being pricked out, can be grown larger, and some growers now treat their whole crop in this way. As a general rule, however, medium-sized roots are more desirable than the larger ones.

Where a good bottom-heat is at command a few Cucumbers may be started; it is, however, unwise to sow these for a few weeks to come, unless a strong steady moist heat can be maintained. A sowing of Tomatoes made now will give ripe fruit about the end of May. Those sown in November are now in six-inch pots and almost ready to be transferred to their fruiting pots. Plants which commenced to ripen early in November are still full of ripe fruit, with plenty coming on. Periodical surface-dressings and applications of liquid-manure to plants in fruit should not be neglected, and artificial pollination must be attended to if a good set of the fruit is desired.

Cold frames containing Lettuce, Parsley, Cauliflower or any other plants require picking over occasionally, and all old and decaying leaves be removed. Snow must not be allowed to lie on the frames, except during severe weather, air and light being essential to the making of sturdy plants.

W. N. Craig.
Taunton, Mass.

Propagation of Chrysanthemums.

A NOTHER season's work among Chrysanthemums is now beginning. Our stock has been stored in a cool, light place just long enough to develop good stocky cuttings, and after looking over the lists of novelties we shall decide which kinds to grow during the coming season. The time to propagate depends upon the use for which the plants are intended, and, to some extent, upon the facilities at command. If we have all the conveniences of heated glass structures, and intend growing large specimen plants, we should commence to propagate now. Those who are less fortunate in the matter of conveniences may wait until spring, and still have time to grow neat specimens, which are really more serviceable for general decorative purposes.

English growers propagate much earlier than is necessary

here, beginning as early as November with some varieties which are intended for specimen flowers. Their plan, however, is somewhat different from ours, as they allow a break of two or three stems, each bearing one bloom. This, with different conditions of climate, accounts for the longer season required. Generally the finest specimen plants they grow are those which have carried three blooms the preceding season. The plants grown and exhibited by Mr. Brooks at the Centenary Festival of the Chrysanthemum Society at the Royal Aquarium were of this kind, commonly called cut-backs, meaning that the old stems had been cut back to within a foot or less of the soil, and allowed only to break from the stem, and not from the root-stock. Very little advantage is gained by following this plan here; under changed conditions of climate we can grow as large plants in eight months as they do in ten months in England.

Although cuttings will root at a temperature very little above the freezing-point, it is better to use a little bottom-heat when this is possible, since it insures quicker rooting and saves time. Select the strongest shoots—suckers if possible—and prepare them with a sharp knife, shearing off a few leaves at the tips, which are liable to hang around the base of the cuttings and encourage damping. Water freely, even to saturation, for the first few days, for on no account should the cuttings be allowed to wilt, and use shading only when the sun shines. The cuttings should be rooted in about three weeks, when they may be potted into small pots, using a light soil at this stage of their growth.

For specimen blooms the first of May is early enough to make cuttings for the first batch, and all that we need do now is to keep our stock as sturdy as possible until then. If the stock is in cold frames now, so much the better, but it would not be advisable at this season to place it in such frigid quarters. If already started into growth, they had better be kept quietly moving, and be topped early in March, and a new crop of cuttings may be made about the first of May.

Ivory and Joseph H. White are still the best early white varieties for specimens, and Minnie Wanamaker and White Cap for late. President Hyde and Mrs. Walter Baker are excellent early yellow varieties, and W. H. Lincoln the best medium to late, and probably the best all-around yellow variety now known. Good reds are yet scarce, and it is difficult to excel Cullingfordii when it is well grown. G. W. Childs makes a very fine specimen. For pinks we have a good selection. Portia was the most admired of all last season. Duchess of Connaught is of a fine lavender shade. The original Louis Boehmer is superior to any of the so-called improved varieties of this flower.

Wellesley, Mass.

T. D. H.

A Few Plants that like Shade.

AMONG the hardy perennial plants that thrive in shady situations, especially under deciduous trees, are many sorts which produce the earliest flowers in spring. A conspicuous group among these are the Trilliums. Although some of them continue until midsummer, their first growth is made while they receive considerable light and warmth from the sun, before the trees have come into full leaf. The Dog-tooth Violets are another class. Our yellow Adder's-tongue, the most common of this group, is one of the earliest wild flowers in spring. The Chionodoxas (Glory of the Snow) succeed well under the shade of deciduous trees. This is owing, no doubt, to their earliness, and deprived of the light they get when they first come up they might not succeed. The Dicentras are suited to such locations, especially *D. cucullaria* (Dutchman's Breeches), and the one commonly called Squirrel's Corn, *D. Canadensis*. An admirable little plant for shade, and one easily established, is Rhue Anemone, *Anemone thalictroides*. It closely resembles the Wind Flower, *Anemone nemorosa*, but lasts longer and is easier to establish. The European Wood, or Snowdrop Anemone, *A. sylvestris*, is another pretty species which likes shade and moisture. The Hepaticas, though they do not require as much shade as some other plants, like shade some of the time at least, and, unlike many of the early plants, they have abundant foliage that lasts until the following spring. They are benefited by a good supply of well-composted manure, and do best if they are not disturbed after they are once established. The Wild Gingers, or Asarums, are shade-loving plants. Though not showy, their foliage is good, and they are useful in many ways. All of our native Meadow Rhues do well in shade, and the early one, *Thalictrum dioicum*, is useful for shady locations, and not as tall as some other species. Both of the Actæs, or Baneberries, though not always found in shade, are well suited to

this condition. Their flowers are pretty in their season, and their fruit is quite as interesting. The Blue Cohosh, *Caulophyllum thalictroides*, and the smaller Solomon's Seal, *Polygonatum biflorum*, are good plants for shade, not so much for their flowers as for foliage. They form fine large clumps during a good portion of the summer. Both species of Twisted Stalk, *Streptopus roseus* and *S. amplexifolius*, do well in shade. I have found that they require more than one season to become established. One of our common wild flowers in northern New England, growing in rich, moist woods, is the large Bellwort, *Uvularia grandiflora*. It bears transplanting well and makes a good showing during most of the summer. False Miter Wort, *Tiarella cordifolia*, is a very desirable plant for moist, shady places, as well as for the rockery. It is one of those species that can be used in various ways and flourishes in shade or sunlight. It is attractive in the front border, and when it has finished flowering its rich dark green foliage lasts throughout the season.

The majority, perhaps, of native Orchids prefer shade. The two yellow Lady-slippers are probably the surest of these to succeed. The little white one from the west, *Cypripedium candidum*, does well in partial shade. About all of our native Ferns like shade, and can be used in such locations with proper preparation of the soil.

Nearly all of these shade-loving plants attain their greatest size in woodlands in a moist, rich, black soil. When they are transplanted into a shady place that has little fertility this want must be supplied, and this can best be done by adding rich soil from the woods. When planting in the shade of trees it is also necessary to supply moisture during dry weather, since trees rob the soil of both fertility and moisture.

Charlotte, Vt.

F. H. H.

Meetings of Societies.

Nebraska State Horticultural Society.—I.

THE annual meeting of the Nebraska State Horticultural Society was held in the State University from January 15th to 17th inclusive. Last year the plan was adopted of confining the meeting chiefly to the apple, so that the report when issued should be in the nature of a monograph on the subject. The same plan was continued this year, except that three fruits were taken up for consideration—the grape, plum and cherry.

THE BOTANY OF THE GRAPE.

Dr. Charles E. Bessey read a paper on this subject, in which he said that there are about thirty-five or forty species of the Grape in the world, of which North America has from eighteen to twenty-three, according to the number regarded as true species. Europe has one, which also extends into northern Africa. Tropical or Central America has two, the East Indies two, and the remainder are found in eastern Asia. It will thus be seen that North America has more species than all other parts of the world together. The genus is confined mainly to the north temperate regions. Few species reach into the tropics, and none at all are found in the southern hemisphere.

For horticultural purposes only eleven species need be considered: (1) These are the northern Fox Grape, *Vitis labrusca*, represented in cultivation by Concord and Catawba; (2) The Mustang Grape, *V. candicans*, represented by Elvican; (3) The Summer Grape, *V. æstivalis* (Herbemont and Eumelan); (4) The Downy Grape, *V. cinerea*; (5) The California Grape, *V. Californica*; (6) The Sand Grape, *V. rupestris* (Munson and America, hybrids with *V. æstivalis*); (7) The Riverside Grape, *V. vulpina* (Clinton, Elvira and Tayler); (8) The Red Grape, *V. palmata*; (9) The Frost Grape, *V. cordifolia*; (10) The European Grape, *V. vinifera* (Black Hamburg and White Chasselas); (11) The southern Fox Grape, *V. rotundifolia* (Scuppernong and Thomas).

The northern Fox Grape has given us nearly all of our best varieties, but this is, no doubt, chiefly due to the fact that this was the species which our forefathers found when they began to improve the native grapes. Yet its distribution, entirely east of the Alleghany Mountains, indicates that it is really less adapted to the needs of the greater portion of the country than some of the other species.

The form of the Sand Grape has been modified till it is almost a bush, and not a climbing plant, like the others. It sometimes has no tendrils to climb with, even if it were not in a region in which there are few trees and shrubs to cling to. The Munson Grape, a cross between this species and the Summer Grape, has been reported to stand a temperature of

twenty-seven degrees below zero. This is a particularly interesting fact, since both of the parents are found in southern latitudes, and this seems to show that it does not always follow that the offspring will be tender if the parents are tender.

The Riverside Grape is the common species in Nebraska. Owing to its wide distribution, this is a desirable parent to use in aiming to secure hardy varieties. Professor Munson says that this must enter into all varieties which are expected to endure the extreme winters of the north-west.

The Red Grape occupies a small region near St. Louis. This is a recent variation from the Riverside Grape, with bright red canes when young and deeply lobed leaves. It is quite ornamental, and has proved hardy at the Arnold Arboretum.

The European Grape in a wild state is very similar to our Frost Grape, with small blue berries. The wonderful improvement which has been wrought in this species leads us to think that we can do almost anything with our best native Grapes by patient and well-directed effort. The European Grape is not important in Nebraska at present, but it will undoubtedly yet be grown here, since it is not the climate that prevents its growth, but the phylloxera, and this can be overcome as well here as in other countries by grafting on the proper roots. The great variation in color which has occurred in varieties of *Vitis labrusca* is an encouraging feature in the possibilities of future improvement from this and other species.

THE PROPAGATION OF THE GRAPE.

This was the subject of a paper read by G. A. Marshall, of Arlington. For commercial purposes propagation from three-eye cuttings is the most practicable way under ordinary conditions. These are taken in the fall, buried in the ground, tops downward, and covered with three or four inches of earth. In Nebraska this needs to be wet thoroughly and then covered with two inches more of soil. When freezing begins the whole is covered with about six inches of hay or similar material. In spring the covering is removed, with the exception of about two inches of soil, and the bed is surrounded with a board frame for protection from winds. This two inches of soil which covers the cuttings must be kept wet without fail. No rotting need be apprehended, and they should be kept as warm as possible, with the frame covered in very cold weather. The time to plant is when they begin to send out roots, which will usually be within fifteen or twenty days after the upper part of the covering is removed. The cuttings should lean toward the north or east when planted, and the soil should be firmly packed about them, and the row covered with a ridge of soil till the roots are thoroughly started.

BREVITIES.

Some of Rogers's hybrids give good satisfaction in the south-eastern portion of the state. For general market purposes Moore's Early proves profitable, owing to its season, though it does not yield more than half or two-thirds as much as Worden or Concord. It bears heavy manuring. The Worden is the best all-round market variety, because it ripens here before competition becomes so close from other localities. Among newer varieties, Eaton is giving satisfaction wherever tried. It ripens with Worden, appears to be as hardy as Concord, and is one of the largest and handsomest black grapes grown.

Grafting the vine above ground was recommended so that the cion cannot send out roots of its own, for this will partially overcome the value of a stock which resists phylloxera. Even varieties of *Vitis labrusca* are somewhat subject to the attacks of this pest, and this susceptibility appears to increase with the age of the vine. The Delaware seems to be affected worse than any other variety.

Professor N. E. Hanson stated that in an experimental hybridizing at the Iowa Agricultural College varieties of Grapes and Strawberries from Manitoba were used, with the hope of securing increased hardness in the offspring. The hardier plant is used as the mother in all cases. He finds the secret in keeping pollen to be in getting it thoroughly dry before it is corked up in the vial.

Western New York Horticultural Society.—I.

MORE than five hundred members of this progressive society met in Rochester last week at its fortieth annual meeting. Nearly all these men are actively engaged in some business connected with fruit-growing, and, perhaps, these meetings bring together more men who are skilled in the cultivation of orchards and vineyards than can be found anywhere else in the country on any occa-

casion. At this meeting, like its predecessors, papers were read by many men of science, from this and from other states, and the business, as usual, was conducted with admirable promptness and efficiency. The officers elected for next year are William C. Barry, of Rochester, President; S. D. Willard, of Geneva, First Vice-president; Secretary and Treasurer, John Hall. We present this week in a condensed form some of the addresses and discussions:

PRESIDENT BARRY'S ADDRESS.

UNPRODUCTIVE APPLE ORCHARDS.—During the past summer I have had occasion to visit several localities in western New York, and I have been greatly impressed with the number of old, worn-out apple orchards, which are an eyesore wherever found, and which should be cut down and used for firewood. It is difficult to understand why so many dead and dying trees have been allowed to stand after having outlived their usefulness. The beauty of any farm is marred and its value depreciated by these old trees. I ask the members of this society to give aid in remedying this condition of things. The public good and local pride demand this. Again, the number of orchards of medium age which are partially or totally neglected is very large. These orchards should be taken care of or destroyed. Few of us realize how much valuable land is unproductive owing to its condition. In most cases, by plowing the sod and fertilizing and pruning, vigor, health and fruitfulness can be restored. Many hesitate to undertake the work on account of the expense involved, but it is evident that there has been too much delay already; we are really forced to meet an emergency and to do something at once. As to the advisability of cultivating and pruning there is no question. A thorough cleaning up will completely change the aspect of our fruit farms and homes, and many places can be made valuable which otherwise are worthless. A grower at Carlton, Orleans County, stated recently at a farm institute that he had thinned out his orchard to the extent of 600 trees, and sprayed the remaining 600 three times with Bordeaux mixture. As a result he marketed 2,400 barrels of fine apples at an average price of \$2.13 per barrel.

FRUIT AS FOOD.—The use of fruit as an article of food is becoming more and more general, though the amount consumed in families is very small compared with what it should be. Very many labor under the false impression that fruit should only be taken at the end of the meal. Fresh fruit should be partaken of at breakfast for at least six or nine months of the year. In the morning it is cooling, refreshing and easily digested. Perfectly sound, ripe fruit should be secured in the autumn for the winter's supply. In this region it is easy to secure apples and pears of the best grades. Wealthy Europeans send their orders annually for a year's supply of fruit to this country, and have it shipped directly to their homes, paying a good price for a superior and selected article. The day is not far distant when it will be possible for all who care to indulge in it to have fresh fruit on their tables the year round, and in this locality it need not be a luxury, for the prevailing prices will be so low as to enable all to buy, and more fruit with less meat will certainly conduce to a healthier condition of body and mind.

COMMERCIAL FRUIT GROWING.—Early in the year the prospects for a large apple crop in this vicinity were bright, the trees blossomed full, but when the fruit had attained the size of hickory-nuts it dropped; this was probably due to a heavy frost in May; then it was predicted that there would be no apples; however, there has been a crop harvested much larger than was anticipated. Many orchards have paid well. Much fruit is at present in cold storage in the expectation that prices will advance later on. I see it stated that Mr. Wellhouse, of Kansas, has marketed 23,000 barrels from sixty-five acres, and that he has produced fourteen crops in fifteen years. We can hardly expect results equal to this, but still the outlook is not discouraging when we consider how neglectful we have been in many respects. In plain English, many of our orchards have been starved. If the proper nutrient be supplied, a change will take place. Surface cultivation and application of potash will do more than anything else to make the orchards remunerative. The time has come when it will not pay to send poor fruit to market in the hope of getting good returns. The large quantities of fruit from California, sent annually to the eastern markets, have made competition keen, and it will become necessary to do as the Californians do—pack selected fruit in small attractive packages. The fertility of our soils has been exhausted, a fact we have to look squarely in the face. Where fruit growing is unsatisfactory it is mainly due to this cause;

with fertility restored and good cultivation, the prospects are favorable for profitable crops.

EXHIBIT AT THE STATE FAIR.—The exhibit made by this society at the State Fair, held in Syracuse, was remarkable, not alone for its extent and completeness, but for the superior quality of the fruit and the attractive manner in which it was displayed. Taken as a whole, it is certain that such a display could not be duplicated anywhere in the United States or Canada. Great care had been bestowed on the nomenclature, so that few, if any, errors could be detected. The exhibit was intended to show, and the object was well accomplished, the capabilities of the genial climate and fertile soil of western New York. Few who enjoy the privilege of living in this region realize the advantages over those who live where fruit is scarce and hard to obtain. The favored few have no monopoly of these delicacies here; every one can enjoy them as freely and as abundantly almost as the air we breathe, and these exhibitions are made with a view of showing what every landowner should and can have if he be so disposed.

SCHOOL YARDS.—I have on a former occasion suggested to this society the importance of adopting measures by which the grounds around our schoolhouses may be relieved of their forbidding aspect. A little labor and expense will transform the surroundings into delightful pleasure-grounds. The trees, shrubs and plants for the purpose can be obtained in any of the near-by woods. The improvement of school-grounds will accomplish a double object—the taste of the pupils will be cultivated, they will become familiar with many charming objects which would otherwise be overlooked, and the garden will serve as an example and pattern for the neighborhood. In the selection of teachers I believe preference should be given to such as are known to be lovers of Nature and who will take pains to awaken an interest in a study of plants. I believe that opportunities for great improvement lie in this direction, and this can be brought about with little expenditure of money.

THE SCIENCE OF TILLAGE.

Professor I. P. Roberts read a paper which explained how cultivation in many different ways made orchards and vineyards productive and profitable. Part of this excellent paper is herewith given:

Most arable soils contain large amounts of dormant plant-food; all soils contain a small amount of plant-food which is available; some plants have the power of setting free this nourishment to a greater degree than others, our common Mullein furnishing a notable example of this power. It is evident, then, that either plants which have unusual power to secure nourishment must be grown on lands which fail to respond, or more nourishment must be provided if the higher and more exacting plants are raised. There is enough of nearly all the elements of plant-food, including potash and phosphoric acid, in the first sixteen inches of ordinary soils to supply crops for several generations if the plants could only get hold of it. There is a great deal of nitrogen, too; more of it in the subsoil than in the upper layers, and this is part of the reason why Clover, Peas, Beans and other deep-rooted plants are so valuable.

When plants languish, if adapted to the climate, it is evident that the soil has not been properly prepared, so that the plant-food in it is not available, or that there is not sufficient moisture to transfer it from the soil to the plant. Cultivation may be made to obviate partly or wholly all these difficulties. Plant-food which is unavailable is useless, and one of the chief objects in cultivating the soil is to prepare this for use by setting it free and diluting it with water so that it can be taken up by the roots of plants, or by opening and loosening a soil that is too wet or too compact to allow the plant-food to be liberated by fermentation.

If water carries plant-food downward it can also be made to carry it upward from the subsoil to the feeding roots of the plant. The soil-water, which in the day-time rises, not only brings with it plant-food, but it enables the plant to secure the nourishment already in the soil around its roots.

Cultivation is a powerful factor in setting free plant-food. It increases the solubility of plant-food by crumbling, rearranges the particles of soil, breaks them up so that no two of them are in the same position that they were before the tillage, and the particles present more surfaces for the roots to act upon with their living chemistry. Cultivation when properly done also hastens nitrification and thus helps to prepare for use the important and expensive element of nitrogen so essential to plant-growth.

Cultivation greatly assists the soil in retaining its moisture in dry weather. The great orchards and vineyards of Califor-

nia are cultivated deeply many times during the early part of the season, and although no rain falls from April to November, the trees and vines prosper quite as well as where there is an abundant rainfall. During the winter months in most of the California fruit valleys the soil is filled with water by frequent rains. By plowing the vineyards and orchards in April, when they have become dry enough to do so, and by keeping the harrows, cultivators and gang-plows at work during May and June, and sometimes into July, nearly all of the moisture of the subsoil is conserved and made available for the growth of the plants. One great object in cultivating the land is to form a mulch. While in early spring, cultivation, as has been said, may serve to dry the land out and open it to absorb heat; later in the season, just the reverse of these conditions is desirable. When a layer of a few inches of dry porous earth is spread like a blanket over damp ground the moisture will not only be kept from evaporating, but plant-food will be set free and chemical action hastened. The mulch of earth made by light tillage will shade the land and keep it cool in hot weather, and in every way be beneficial. In California four or five tons of water, which would otherwise evaporate from every acre, are held for use in the soil by this mulch of surface tillage.

Before the orchard or vineyard is set, the ground should be plowed, subsoiled and summer-fallowed for an entire season, because there is a vast amount of plant-food in the soil, and it is cheaper to secure it by cultivation than to add plant-food from outside sources. Then, too, the thorough preparation of the soil brings it into firm physical condition, serves to aerate it and also to promote drainage. Too much stress cannot be laid upon the thorough preparation of the land for orchards and vineyards, or any other crop that is to remain upon the land for several years. After the plants have been set the surface cultivation should go on as carefully and systematically as though a crop were expected immediately.

On most fruit-plants a light dressing of phosphoric acid (in some form of bone, say), when the trees and vines have come into bearing, will produce most satisfactory results, and in almost all cases where plant-food is slightly deficient a dressing of potash will be found to be extremely beneficial. A sowing of ten or fifteen pounds of Crimson Clover to the acre at the last cultivation of the orchard will furnish, unless in exceptional cases, all the nitrogen needed when it is turned under next year. By a little observation the planter should learn to know by the size and character of the leaf, by the growth of bark and the amount of wood made each season, the character of the plant-food which should be added.

Mr. James A. Root spoke of the good cultivation practised by the Mennonites in Kansas and Nebraska, on account of which they had crops last year while their neighbors had none. By thorough cultivation in a dry time we can often get a better crop than the average in a wet season.

Recent Publications.

The forty-fourth and forty-fifth parts of the English edition of *Lindenia*, or an Iconography of Orchids, published by Lucien Linden, of Brussels, has just reached us and maintains in the beauty of its illustrations and the excellence of the descriptive matter which accompanies them the standard set by this important work in its earlier numbers. In the present parts there are figured *Cypripedium Denisianum*, a hybrid between *C. seligerum* and *C. superbiens*, and described as a strong grower, very prolific, and one of the most desirable hybrids of its class; *Cattleya Mossiae*, var. *Treyeranæ*, a variety with broad rose-colored petals and sepals and a lip covered by a bright golden-yellow blotch on which the close red streaks appear as dark purple passing into maroon; *Odontoglossum Pescatorei*, Prince of Orange, a variety of distinctive character, due to the orange-yellow-ground color of the segments and the shape of the lip; *Cattleya Cupidion*; *C. guttata*, var. *tigrina*, a distinct form of one of the best-known and longest cultivated species of the genus; *Catasetum macrocarpum*, var. *Lindeni*; *Cypripedium Charlesworthii*; and *Mormodes Cogniauxii*, a recent introduction from Columbia, that flowered for the first time in Europe last June, in the garden of the Société de l'Horticulture Internationale of Brussels, and was dedicated to Monsieur Alfred Cogniaux, who has described the Brazilian Orchids in Martius's *Flora Brasiliensis*.

Notes.

Experiments conducted at the Alabama Experiment Station with Ragi Millet, Eleusine coracana, and Kodo Millet, a species of Paspalum, both obtained from the Madras Presidency, seem to prove that these plants will make good pasture crops for cows and other stock, and also be profitable hay-producing plants in the southern states.

A Tennessee paper states that Mr. Thomas L. Walker, seventy-five years ago, planted four walnuts on his father's farm, near Knoxville. Mr. Walker died ten years ago, when the four Walnut-trees grown from the seed he planted averaged four feet in diameter, and their value, if cut and sawed, would have been not less than \$400 a piece.

The *Pacific Rural Press* gives an illustration of the Calla Snowflake, which is one of Mr. Burbank's new creations. It is a seedling of the dwarf variety Little Gem, but its flowers never grow half as large as those of that variety, and the leaves are also much smaller. The flowers are snowy white and gracefully moulded, and it is altogether the smallest Calla yet produced.

We have received the first number of the *New Jersey Forester*, which is a bimonthly pamphlet devoted to the development of the forests of that state. It contains twelve pages of instructive matter, and the leading article, by Mr. Fernow, gives the best kind of advice to the owners of New Jersey woodlands. The pamphlet is the official organ of the South Jersey Woodmen's Association, which was organized to protect the forests in that section, to insist upon the enforcement of laws in relation to forest-fires, and to encourage such management of woodlands and waste lands as will help to conserve the water-supply, protect game and insure a continued supply of forest products.

The *Southern Lumberman* says that mahogany logs from the east coast of Africa have got as far west as Louisville, Kentucky, and adds that it is much cheaper than the mahogany from Central America and Cuba. From these Mahogany forests in Africa it is said that twelve million feet of lumber have already been cut and exported, and they promise to yield an immense revenue to the British and French colonists who have seized upon the territory. The wood has a tinge of pink in contrast with the somewhat reddish color of the American variety, and some of the squared logs which have been imported are two by three and a half feet in size. We may add that this African mahogany is the wood of Khaya Senegalensis, a tree which belongs to the same family as the true Mahogany, and is closely related to it. It is not so desirable a cabinet-wood as the Mexican or Cuban Mahogany, but is more like the Central American wood. Occasionally there are logs richly figured, and these have been manufactured here into very attractive veneering.

At the late meeting of the Ohio Horticultural Society, Professor Green, of the State Experiment Station, in a report on new fruits, stated that Eldorado promises to take a place among standard varieties of Blackberries. It has endured a temperature of twelve degrees below zero, and is certainly hardier than Lawton or Erie, which it nearly equals in size of berry, and probably is as hardy as Snyder or Ancient Briton. Of larger-fruited berries, Minnewaska is about the hardiest. Among Raspberries, the variety Ebony bears black berries, which present a beautiful appearance in a basket. It is of medium size and season. Eureka commences to ripen early, and bears very late, covering the entire season of Palmer and Gregg, and yielding about as much as both together. The Gault seems to be an exception to the so-called ever-bearing varieties, which are generally worthless, in that it is vigorous and exceedingly productive. The main crop begins to ripen with the Gregg. The berries are large and firm, and the plant bears through a very long season.

A correspondent of the *Strawberry Culturist* writes that he last year tried the so-called trench system which he heard was practiced at the Bryant Nurseries, in Quincy, Illinois. The plan is to dig trenches sixteen to twenty inches deep, leaving a space of but six to eight inches wide at the top between them. The trenches are then filled with straw and coarse manure, which is trodden and pounded firmly. The plants are set on the ridge between the trenches, and the litter is said to retain water enough from the early rains to carry the crop through the dry summer. The claim is that larger and more berries are produced, and by cutting the runners along the edge of the straw the same rows may be kept for years,

with only a narrow strip to weed. Certain difficulties in the mechanical construction of such beds at once suggest themselves, and there seems to be no good reason why water will remain so much longer in straw than in earth. We should counsel novices to proceed slowly if they propose to make any experiments with the new method.

A correspondent of the *Gardeners' Magazine* writes of his success in raising plants of Pteris, Adiantum and other Ferns from spores in the following way: With a hammer and chisel he cut a basin three-quarters of an inch deep in the wide side of a brick, leaving a ridge around the edge. Into the bottom of this depression he placed a thin layer of finely pulverized brick-dust made from the particles which he had chiseled out of the cavity. On this layer he sowed the spores of the Ferns, and then covered the brick with a sheet of glass which rested on the edges of the basin. He then set the brick in a shallow dish or saucer in which water was constantly kept, and the whole was placed on the top of a pipe under a stage and properly shaded. The house had a flow and return pipe only, but, of course, all that is needed is some position where proper warmth and shading can be given. The porous brick will take up from the little water kept in the saucer enough to supply the needed moisture to the spores, and when the young Ferns are ready to prick out, the layer of dust makes their removal simple and easy. The writer thinks that amateurs sometimes fail in raising Ferns from spores by keeping the temperature low, when too much water sours the soil, or too little cakes it and kills the spores.

Raffia, which is the cuticle of the leaf of the Madagascar Palm, has been for some years dexterously plaited in ladies' hats, although most of the wearers have been innocent of the material which formed their head-dress. In the same way bast, or the inner bark of Hibiscus elatus, another fibrous substance which gardeners use for tying, has been pressed into the service of the milliners after being bleached and dyed, and when it is so treated, and twisted or braided, it forms a very light lace-like material. The bark of the Baobab, Adansonia digitata, after being well bleached, is also used for the same purpose, but many of the milliners' materials are so completely changed by the different processes which they undergo, that it is hard for an expert to determine their botanical origin. Split willow wood, which under the name of chip was largely used thirty or forty years ago for hats and bonnets, is once more bleached and dyed and plaited for this purpose, while single fibres of the Sisal Agave and Manilla Hemp, Musa textilis, are placed side by side and united by means of gelatine into a tape-like form and submitted to a heavy pressure, which not only gives a thin material like flattened straw, but one with a remarkable gloss, due to the pressure. The varieties of design in which these Sisal and Manilla plaits are used are endless, and there is a great demand for them all over the civilized world.

Besides potatoes, Bermuda is now sending limited quantities of onions, beets, lettuce, string beans, spinach, parsley, carrots, peppers, kohlrabi and strawberries, and small lots of beans, onions and okra come from Cuba. The importations of potatoes from Europe since the first of October have fallen short of those received last year by 150,000 bags, while the receipts of domestic potatoes during the same time in this city has been increased by about the same amount. The first rhubarb of the season in this market is from Long Island hot-houses, and sells at retail for twelve and a half cents a bunch. Catawba grapes are occasionally seen in fair condition, a small basket costing twenty-five cents. Selected Spitzenberg apples are quoted as high as \$6.00 a barrel at wholesale, Greening, Northern Spy and Baldwin apples ranging from \$3.00 to \$4.50. A few Bellflower apples find ready sale in the fruit-stores at thirty cents a dozen, showing that they are considered choice fruit here, although in Philadelphia markets they are esteemed more highly. Some of the showiest and best Newtown pippins seen here this winter are now coming from Vermont. These bring from sixty cents to \$1.00 a dozen, or \$8.00 a barrel. The last Beurre d'Anjou pears, from Rochester, are now in the market, along with large and showy Easter Beurre pears, from California, which have been carried along in cold storage. The latter cost \$1.00 a dozen. Winter Nelis, Comice and P. Barry are in fair supply, and bring from forty to seventy-five cents a dozen. There is nothing to add to what has already been said about the destruction of the orange crop in Florida. The scarcity of all citrus fruits will probably have a tendency to hurry forward the supply from California, and a few small sample lots have been reported already.

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TABLE OF CONTENTS.

EDITORIAL ARTICLE: —The Forests on the National Domain	PAGE.
Fructification of the Cork Oak	51
The White Elm in the West	C. E. Faxon.
FOREIGN CORRESPONDENCE:—London Letter	Professor Charles A. Keffer.
NEW OR LITTLE-KNOWN PLANTS:— <i>Gunnera manicata</i> . (With figure)	W. Watson.
PLANT NOTES	W. W.
CULTURAL DEPARTMENT:—Treatment of Amaryllis	E. O. Orpet.
Sweet Potatoes from Slip Seed	Professor M. H. Beckwith.
Chinese Primroses	E. O. Orpet.
MEETINGS OF SOCIETIES:—Nebraska State Horticultural Society.—II	57
Western New York Horticultural Society.—II	58
NOTES	59
ILLUSTRATIONS:— <i>Gunnera manicata</i> , in Cornwall, England, Fig. 8	55

The Forests on the National Domain.

WHAT is to be the fate of forests on the national domain, and how is the much larger forest area of the country, now in private hands, to be managed in the future, are questions which, a few years ago, would have excited but trifling interest anywhere in the United States. The current issue of *The Century* magazine shows that these matters are now subjects of serious study by many thoughtful Americans. The editor of a great periodical is a good judge of what subjects are of immediate popular interest, and the fact that *The Century* not only makes a distinct proposition of its own for action in the matter of forest-preservation, but devotes ten pages to setting forth the views of persons who, from their official standing or personal knowledge, are qualified to say something worth hearing on the subject, is an evidence that we are gradually nearing the time when indifference and lethargy in relation to this matter will give place to an active realization of the fact that the prosperity of our country is directly connected with the proper management of our forests.

Six years ago, when speaking of the nation's forests, it was urged in this journal that all forest-lands belonging to the Government should be withheld from sale until an examination of these lands, and of the agricultural lands depending upon them for water-supply, would show what tracts of timber could be put upon the market without threatening important interests in the country below them. For the protection of these forests against injury from man and beast, it was advised that, pending this investigation, the guardianship of the forests on the national domain should be entrusted to the United States Army, and that this examination of the national forests should be conducted by a commission, appointed by the President, of men able to report upon the magnitude and quality of our forests, and upon their relations to other interests. No commission was appointed, however; perhaps the time was not ripe for such a plan, modest and moderate as it was; but certainly if such a commission had then been named, we should now know more about our forests than we do. In *The Century* symposium a man so well qualified to speak as Mr. Bowers, the Assistant Commissioner

of Public Lands, declares that estimates of the amount of forest-land owned by the Government vary between the lowest and the highest by twenty millions of acres, which means that we have no absolute knowledge whatever. And since no one can do more than make a rough guess at the area of these lands, any surmise as to the amount of timber growing on any portion of them, or of its value, or of the ease or difficulty with which these woodlands can be made permanently productive, would be wilder still. It seems, then, that the need of a board of investigation is quite as urgent to-day as it was when the proposition was first made, and *The Century* now advocates the creation of a commission, composed of men whose reputation will give their recommendations weight, and whose duties shall be to study the whole question of forest-preservation, and report fully upon it to Congress.

Such action need not interfere with any other legislation, for the first thing to be done under any scheme would be to get more knowledge, and no better way of obtaining information about our forests can be devised than that of sending competent men to the ground to examine them. *The Century* also revives the other recommendation that until this report is made all forest-lands should be withheld from sale. And why not? No private interest can suffer by such a delay. No one has an inalienable right to demand that the Government shall sell him a wood-lot. It is true that there are delicate questions involved in the necessities of pioneers, who need wood for fuel or timber for mines. This is one of the very points which such a commission should be called upon to study, and certainly it would not be unwise for the Government to hold fast to all its lands until they could be disposed of more intelligently.

There seems to be little question as to the advisability of employing the army as a police force while this investigation goes on. Captain Anderson, who has been in command of the troops in the Yellowstone National Park, ought to be a competent judge in this matter, and in his contribution to the symposium it is stated that the soldiers of his command have served every purpose of a forest-guard most satisfactorily. There have been suggestions about lectures on forestry in West Point, with an experimental forest-reservation on the Highlands, but upon these points there are differences of opinion. It is admitted that there would be an advantage in giving officers of the army a brief course of forest-study, and there are objections to the plan which it is not necessary to state, but there seems to be no question that the army is the one body now properly organized to take charge of our forest-reservations, to protect them from fire and trespassers and to execute any regulations imposed upon them by Congress. Such police work does not need any exhaustive knowledge of forestry, and undoubtedly the army as it is can protect the reservations and all the national forests as thoroughly as they have protected Yellowstone Park. Of course, this service would only be temporary, for the time is coming when a policy, which only means mere protection of the woods from timber thieves and browsing animals and fire, must be replaced by an active system of reproductive management such as is used in other industries of this country and in the forests of other civilized nations.

It is to be hoped that the press of the country will unite with *The Century* in this recommendation to Congress. No one doubts that something ought to be done, and done now. No one has suggested anything that will cause less disturbance, and which, with so small an outlay, promises so much. No elaborate machinery is called for, no large appropriation. Congress is simply asked to help secure the knowledge which is needed before an intelligent and consistent scheme can be devised for managing this great property which is now wasting so rapidly away before our eyes. Of course, we must ultimately have some comprehensive system of forest-management. No such system can be carried into execution, however, unless it is based

upon consenting and upholding public opinion, and we can imagine no better means of creating this prevailing sentiment than the publication of such a report as is contemplated. It will be a long time before the country will be prepared for any system of forestry which will need the supervision in all its details of persons skilled in the refinements of the highest scientific practice. But we must begin right. Mr. Fernow very properly insists that our first need is common-sense treatment of our natural woods. But common-sense treatment is what our woods have never had, and they never will have such treatment until the people are instructed in the elementary principles of sound forestry. The inauguration of a common-sense policy will only come from the teaching and example of those who are masters of the whole subject, and who foresee that the great advantage of such a policy is that it will be a broad-set foundation for more scientific and rational practice. We need the very best of counsel at the outset, and the more thoroughly the problem is studied now the more certainly shall we avoid fundamental mistakes which it would be the work of years to correct.

Fructification of the Cork Oak.

IN Professor Coutinho's valuable paper on the Oaks of Portugal* there are some interesting statements regarding the fructification of the Cork Oak, *Quercus Suber*, which has been generally considered as an annual fruiting species, but which in certain localities in Portugal is found to produce both annual and biennial fruit. It would be interesting to learn whether any of the native species on our southern seaboard ever behave in a like manner. The only analogous case, so far as I am aware, is that of *Q. myrtifolia*, a normally biennial fruiting species, which Dr. Mellichamp finds producing annual fruit plentifully at Bluffton, South Carolina. With the object of drawing the attention of our students of Oaks to this subject I translate the following extracts from Professor Coutinho's paper:

The flowering of the Cork-tree is with us subcontinuous. It is most abundant from April to July, but occurs in almost all the other months, and appears to be interrupted only by the extreme heat of summer or cold of winter. Maturation takes place from August to February, the fruit ordinarily falling in three more or less distinct crops—the first, which our farmers call "bastão," in September and October; the second, called "lande," in November, and the third, which constitutes the "landisco," or "lande serodia," in December and January. It should be remarked that most of the time these fruits are inserted in shoots bearing leaves of the year, and are evidently produced and developed in a single season, but in some cases the fruits produced from the last flowers of autumn or winter, not meeting then the warmth necessary for maturing, pass the winter in an undeveloped condition, and only ripen in the following spring or summer after the growth of new shoots, appearing then mature on the woody branchlet of the previous year, which may be at that time furnished with or bare of leaves. This fact appears due more to particular weather conditions than to an especial organization of the trees in which it occurs; in short, it is not constant with a given individual, nor is it exclusive, the same individual being able to produce fruits plainly annual.

* * * * *

Many botanists consider the Cork Oaks of Europe as belonging to two species, one chiefly characterized by annual fructification and the persistence of the leaves for two or three years (*Quercus Suber*, L.), the other by biennial fructification and annual persistence of the leaves (*Q. occidentalis*, Gay).

Recent botanists and silviculturists have frequently discussed the existence of *Quercus occidentalis* in the Peninsula, and some have even doubted its being a good species. Brotero, in the *Flora Lusitanica*, includes all the Portuguese Cork Oaks in the Linnaean species, *Q. Suber*, and makes no remark about the maturation of the fruit and persistence of the leaves of these trees. Later, Dr. Welwitsch considered the Cork-trees of Cintra as belonging to *Q. occidentalis*, and the specimens sent to France, and studied by Gay himself, were determined by him as belonging to his new species, and as such cited in De Candolle's *Prodromus*. Lastly, Sr. Barros-Gomes dis-

puted this assertion, affirming that the Cork Oaks of Cintra belong to the Linnaean species, and denying that *Q. occidentalis* should be considered a good species. We transcribe the principal reasons he adduced:

"The Cork-tree of Cintra collected by Welwitsch, and determined as *Quercus occidentalis* by the followers of the new classification, does not have fruit more biennial in appearance than many others, in which there is no doubt of its being in fact annual, and only apparently biennial. It is very common in Portugal to find an apparent biennial maturation of fruit that is really annual, because the growth of the Cork-tree with us often admits the formation of one, two, or even three new growths in a single year, exactly as occurs in the common Oak, *Q. pedunculata*.

"The prolonged flowering of the Cork-tree, commencing in April, hardly ceases during the dry season, and is renewed with the first rains of autumn, giving rise to two or three successive crops of acorns, the last of which matures in January. It is often accompanied with successive new growths and partial falling of the leaves of the year, so that the lower branches, only a few months old, become bare, and have the biennial appearance to which we refer. In the common Oak, whose foliage is wholly annual, fruit is found apparently biennial by insertion, and, nevertheless, plainly annual by the coexistence of leaves with the same insertion.

"The foliage of the Portuguese Cork-tree, with annual fruit, is not persistent, as a rule, during two or three years, as Mathieu affirms of the species he describes as *Quercus Suber*, nor by any means is it always annual as in the one he calls *Q. occidentalis*, but it varies with the meteorological behavior of each year or with local conditions, in some years wholly falling, in others persisting more than one and sometimes two years.

"It does not appear that our Cork-trees, even those of Cintra, have from January to April acorns in immature condition." (*Condic. Flores de Port.*, pp. 56, 57.)

Contrary to the last statement of Sr. Barros-Gomes, we found in 1886, toward the end of February, living fruit but little developed on specimens gathered near S. Thiago de Cacem, fruit evidently produced the previous season, and which could only mature in the season to come. With this fact was correlated a very peculiar form of the scales of the cup exactly agreeing with the Cork-trees of Cintra, identified as *Quercus occidentalis* by Welwitsch and by Gay himself. Furthermore, the existence of some bundles in the central parenchyma bounded by the arc of the fibro-vascular bundles of the petiole, was observed, like those which occur in the trees of Cintra, and which, according to De Candolle, is peculiar to *Q. occidentalis*, not being found in *Q. Suber*. These reasons led us to affirm the existence of *Q. occidentalis* in Portugal in our *Esboço de uma Flora Lenhosa*, lately published.

To-day, however, after a careful study of very numerous specimens, living and dried, from many parts of the country, we are obliged to greatly modify our former opinion and have arrived at the following conclusions:

1. The Cork Oak in our climate has an almost continuous flowering, as Sr. Barros-Gomes well says. We have seen specimens in flower (living or dried) in the months of January, February, April, May, June, July, September, October, November and December.

2. With this almost uninterrupted flowering there is a corresponding fructification similarly uninterrupted from the end of August till February. It is to be noted—a fact not found in our other Portuguese Oaks—that it is common to find on the same branch fruit in very different degrees of development; for example, a mature fruit in the axil of one leaf, and very small fruit, hardly formed, in the axil of a higher leaf.

3. The last fruits formed before the cold weather may persist through the winter and develop the following spring or summer. We have seen specimens in this state (with very small living fruit, from December to March) from S. Thiago de Cacem (above referred to), from Cintra, from Coimbra, from Portello and from Alemtejo. These fruits are produced in one season and grow and ripen during the following one, contrary to the statement of Sr. Barros-Gomes.

4. It is certain that the Cork-tree frequently makes two growths in one year, but we consider it quite easy in this case to distinguish the false biennial insertion of the fruit. When the tree makes two growths in a single year, the second or summer shoot is more pubescent, less woody, with narrower leaves, and has thus a characteristic appearance.

5. These biennial fruits are not constant in certain trees, but appear or not according to localities or seasons, and on the same trees annual fruits may be developed also. In proof of this assertion we will say that in the end of last February,

while examining carefully the Cork-trees of Cintra, which usually fruit abundantly, we found very few biennial fruits, and on the same branches we saw the cups of fallen acorns with annual insertion. We will add that in Welwitsch's specimens, collected at Cintra, many are found with mature annual fruit, to one of which he affixed the following note: "Probabiliter nil nisi forma Q. Suberis, L., squamis cupularum plus minus hebetatis. Fructus pleniter maturi et alii sat juveniles, nec non fructus maturescentes saepius in uno eodemque pedunculo inveniuntur!!" We will add, moreover, that we examined from Coimbra, whence we had numerous biennial specimens, some others perfectly identical, with annual fruit, and Sr. Moller, at our request, examining again (the end of February) these trees, found very few biennial fruits, this apparently not being a common occurrence there.

6. It is no wonder that in certain places of great humidity, as Cintra, Coimbra, etc., the Cork Oak has an almost continuous growth and easily produces biennial fruit. It is also in such places that other species of the genus *Quercus* (*Q. Lusitanica*, *Q. humilis*, *Q. pedunculata*) frequently make (especially the first) two new growths, an indication of more continuous vegetation.

7. It is worthy of note that in various parts of the country it is said that certain men experienced in rural affairs know in winter whether the following year will be abundant in "bastão" (the first crop of acorns) by the presence of very small fruit, which, in this condition, they alone recognize. This fact appears to confirm the accidental presence or absence of fruit in the process of biennial maturation.

8. From what we have said, the maturation of the Portuguese Cork-tree cannot be said to be strictly either annual or biennial, but rather sub-continuous, hardly interrupted by the cold of winter; and for this reason it is impossible to base specific distinctions on the differences of this maturation.

In the same paper there is an interesting account of the hybrid Oaks thus far detected in Portugal. Among the eight indigenous species, four of these supposed hybrids have been found.

C. E. Favon.

Arnold Arboretum.

The White Elm in the West.

THE Elm is one of several trees that are invariably recommended for planting in the west, but for which hardly any economic use is known. The timber is tough and hard, and is used in making wheels and saddle-trees, but its use about the farm is limited, as it is not durable in contact with the soil, and it is very difficult to season. Too much can hardly be said of its beauty of form, but in close forest-growth this is of small importance. It is native as far west as central Kansas, and a little farther in Nebraska. It endures low temperature well, and large specimens are found along the Red River in North Dakota. Although its habitat is always near streams or lakes, where its roots have a constant water-supply, it makes better growth in dry situations than many other species, and is altogether superior for high land to Black Walnut and Cottonwood. Thus far it has been quite free from insect pests in the west, but it can hardly hope to escape the destructive beetle that is defoliating the Elms throughout the east. In South Dakota cut-worms often cause great damage to seedlings, and they even climb into two and three year old trees and eat off their leaves. The larva of the emperor moth also attacks the foliage.

In rapidity of growth the Elm is one of our most satisfactory hard woods. In the South Dakota Agricultural College plantations, at Brookings, White Elm planted with Box Elder six years ago now equals the Box Elder in height, though for the first three years the latter tree grew the more rapidly. In a plat of hard woods, White Birch grew most rapidly, then White Elm, Black Wild Cherry and Green Ash, with but little difference between the three first named. At Hutchinson, Kansas, in the railroad plantation, now about twenty-four years old, White Elm and Cottonwood were planted in alternate rows. The Cottonwoods now stand from fifty to sixty feet high, and the Elms are completely overtopped, being scarcely thirty feet high, and making feeble growth.

In another part of the plantation, where their neighbors are Honey Locusts and Silver Maples, they are doing very

much better. The Elm is a light-demanding tree, and does not succeed where overtapped by other species. At Farlington, Kansas, an Elm that has evidently sprung from seed in a plantation of Catalpa speciosa has outstripped the Catalpa both in height and diameter. No Elms were included in this plantation, and comparisons cannot be given. The trees at Brookings stand in a rich loam above stiff clay, and those at Hutchinson are in the sandy loam of the Arkansas valley, with water within ten to twelve feet of the surface—an ideal soil for the Elm.

Several of the newer streets in Denver, Colorado, are planted with White Elm, and under irrigation the trees fully equal the best growth observed in the east.

Washington.

Charles A. Keffer.

Foreign Correspondence.

London Letter.

DENDROBIUM WATTII.—This plant first flowered at Kew in October, 1882, soon after it had been received from Dr. Watt, the Indian botanist, who found it in Munipore. It was figured and described by Sir Joseph Hooker in the *Botanical Magazine*, t. 6715, under the name of *Dendrobium cariniferum*, var. *Wattii*. In 1888 Professor Reichenbach elevated it to the rank of a species because of its differing from *D. cariniferum* in having slenderer stems, narrower leaves, larger flowers and a terete, not triquetrous, ovary. Sir Trevor Lawrence exhibited it in flower this week, and it was awarded a botanical certificate, although it merited the highest award. The flowers are borne in pairs on short racemes, and there are six or eight flowers on the apex of each stem; these are two inches across, pure glistening white, with streaks and a blotch of deep yellow on the front of the labellum. In effect the flowers are equal to those of *D. infundibulum* (*Janesianum*), and nearly as fine as *D. formosum*, to which *D. Wattii* is closely allied.

SACCOLABIUM MOOREANUM.—This is a pretty little Orchid which we owe to Messrs. F. Sander & Co., who introduced it from New Guinea along with *Dendrobium Phalaenopsis*, and with whom it flowered in October, 1892. It is named in compliment to Mr. F. Moore, the keeper of the Glasnevin Botanical Gardens, where there is an exceptionally rich collection of Orchids. Two plants of it are now in bloom at Kew—one, the type, having rose-purple flowers, the other, white flowers. The plant is less than six inches high, with distichous leaves, four to six inches long by an inch in width, the apex bilobed. The scape is horizontal, six inches long, bearing a conical raceme, two inches long, of crowded small flowers, which in the type are a pleasing shade of rose-purple, the segments tipped with bright green, while in the variety they are milk-white, with green tips. As a garden-plant this species takes rank with such Orchids as *Saccolabium ampullaceum*, *S. Hendersonianum*, *Phalaenopsis Parishii*, *Masdevallia triglochin* and similar diminutive, but charming as well as interesting things.

MORMODES ROLFEANUM is handsome enough to be classed with good garden Orchids. It was introduced four years ago from Peru by Monsieur Linden, and named by him in compliment to Mr. Rolfe, of Kew. There is a colored plate of it in *Lindenia*, 1891, t. 289, and there is a plant of it in flower at Kew now. It has a two-flowered scape six inches long, and the flowers are as large as those of *Mormodes luxatum*, but colored tawny yellow, shaded with green on the sepals and petals, while the twisted lip is colored apricot-red. All the *Mormodes*, with their cousins, the *Catasetums* and *Cyanoches*, are worthy of cultivation, but, as a rule, they do not like to be cultivated; at any rate, they are rarely seen in good condition after they have had about two years of artificial treatment. They do best when grown in baskets suspended near the glass in a hot moist house till they have finished their growth, when they should be placed in a drier, airy house and rested thoroughly till the growing season comes round again. Of course, they grow in summer and rest in winter—that is, when they behave properly.

PHALÆNOPSIS F. L. AMES.—I lately saw a flower-scape of this fine Orchid which measured eighteen inches in length and bore sixteen flowers and buds, which had been grown in the garden of Lord Rothschild, at Tring. Messrs. J. Veitch & Sons created this hybrid by crossing *Phalænopsis amabilis* with *P. intermedia*, and first flowered in 1888, when it was named "in compliment to the late Hon. F. L. Ames, of North Easton, Massachusetts, a liberal patron of horticulture and the possessor of one of the finest Orchid collections in cultivation." The flowers are as large as those of an ordinary variety of *P. amabilis*, measuring three inches in diameter, and they are white, except the lip, which is lined and shaded with salmon-red. This peculiar color, together with the form of the lip, are the only marked indications of the other parent, *P. intermedia*, itself a hybrid from *P. rosea* and *P. aphrodite*; or, to be precise, a plant raised from these two by Messrs. Veitch, and flowered in 1886, proved to be the same as the *P. intermedia* introduced by Messrs. Veitch from the Philippines, and named by Lindley in 1853.

PLEUROTHALLIS SCAPHA.—There are about four hundred species of *Pleurothallis*, and there are not four that are considered worthy of cultivation. I know three—*Pleurothallis Roezlii*, *P. insignis* and *P. scapha*. The first named of this trio has nodding racemes of purple-red flowers, each over an inch long, and has been in cultivation about ten years. *P. insignis*, which differs from *P. scapha* only in having a bearded lip, first flowered at Kew in 1887. *P. scapha* was named by Reichenbach in 1874 from a plant in the collection of the late Mr. John Day. There is a good example of it in flower now in the cool Orchid-house at Kew. This plant is about a foot high, with ovate oblong leaf-blades and slender scapes, from six to nine inches long each, bearing five to seven flowers, which are remarkable for the length of their filiform segments; they are three inches long, and colored dull creamy white, tinged and streaked with dull crimson. The lip is small, glabrous, with the lateral lobes curiously twisted over the front lobe. It is difficult to describe the flowers intelligibly, but they may be said to resemble the insect known as daddy-long-legs.

VANDA KIMBALLIANA.—There is an illustration of an exceptionally well-flowered group of this fine *Vanda* in *The Gardeners' Chronicle* this week, and it teaches a lesson worthy of the attention of the Orchid-grower who does not know that this plant does best when grown in a cool house. In Messrs. Low & Co.'s nursery at Clapton, where it is grown in quantity and grown well, it is placed along with *Odontoglossum crispum*, except during winter, when it is put into a Cattleya house. If treated as a tropical Orchid it soon succumbs to thrips and damp. The grower of the group of plants mentioned above, Major Mason, says he grows them at the coolest end of a warm house in baskets suspended near the roof glass. They are planted in sphagnum and crocks and they grow in a marvelous manner. It is one of the handsomest of the smaller species of *Vanda*. It has subcylindric leaves and scapes a foot or more long, bearing from six to twelve flowers, each two inches across, white, with an amethyst lip.

CYPRIPEDIUM HENRY GRAVES was exhibited at the last meeting of the Royal Horticultural Society, having been brought in flower by Mr. Dimmock from Mr. Graves' garden in New Jersey, where it was raised from *C. Lawrencianum* crossed with *C. Marshallianum*. It obtained an award of merit on account of the singular form of its dorsal sepal and its color, which is apricot-yellow, with rosy dots. *Cypripedium* Mrs. Fred. Hardy, a hybrid between *C. superbiens* and *C. bellatulum*; Madame G. Truffaut, a hybrid between *C. ciliolare* and *C. Stonei*; and *Cypripedium* J. H. Berry, from *C. Harrisianum* and *C. concolor*, were exhibited by Messrs. F. Sander & Co., the raisers, and were considered worthy of the award of merit. Two other certificated hybrid Cypripediums, shown by Messrs. J. Veitch & Sons, were *C. mimoso superba*, raised from *C. Spicerianum* and *C. Arthurianum*, and *C. Norma*, a hybrid between *C. Niobe*

and *C. Spicerianum*. These "pedigree" Orchids are nuisances, in a literary sense at any rate.

LÆLIA PURPURATA.—This Orchid must be still growing in immense quantities in its haunts, the woods of Santa Catharina, for, during the last twenty years at any rate, it has been imported by myriads, and still they come. Next week one nursery firm offers to sell by auction "seventy cases of *L. purpurata*, large plants in grand condition," and another offers one thousand grand masses of it to be sold without reserve. A good variety of this *Lælia* is a superb Orchid, but it varies a great deal, and one too often meets with forms that are thin and spidery in form and poor in color.

LÆLIA AUTUMNALIS is also very abundant in England now, large importations of it having recently arrived. I saw thousands of fine, healthy masses of it in a nursery near London a few weeks ago. This, too, is an Orchid of great merit; indeed, it and its ally, *L. anceps*, are unsurpassed in the genus, considering them from all points. They are easily grown, they flower freely and their flowers are beautiful.

WILLIAM THOMPSON, the famous Scotch gardener, nurseryman, and author of several classical horticultural works, died on the 12th ult. at Clovenfords, after a short illness brought on by a fall. He was in his eighty-first year. Thompson, of Clovenfords, formerly Thompson, of Dalkeith, was as prominent a figure in the horticultural world as Hooker, of Kew, or Gray, of Harvard, in the realms of botany. To quote from the editorial notice in *The Gardeners' Chronicle*, "He was a prince among gardeners, of stately mien, and of great tact, using his influence at all times for the advancement of gardeners and gardening. He was a man of strong common sense, thoroughly practical in all his ways and his teachings." He worked in private gardens till 1871, when he started as a nurseryman at Clovenfords, where he grew grapes largely, and latterly Orchids. His book, *A Practical Treatise on the Cultivation of the Grape-vine*, is a standard work with vine-growers.

W. Watson.

New or Little-known Plants.

Gunnera manicata.

ENGLISH horticulturists who have an eye for noble foliage-plants available for outdoor effects do not fail to make use of the two big-leaved *Gunneras*, namely, *G. scabra* and *G. manicata*. They are not exactly hardy here, except in the warmer parts of the country, for even at Kew they require protection in severe weather and from cold winds in spring. But in such favored places as the south of Ireland, South Wales, Devon and Cornwall, they are quite at home and grow to an enormous size.

The view represented in the accompanying picture is in the garden of Mr. Pendennis Vivian, at St. Martin, Cornwall. The value of the *Gunnera* in the garden is here shown exceedingly well. Nothing could be finer than the effect it produces by the side of a lake with *Arundo*, *Gynerium*, Bamboo, *Richardia* and other moisture-loving plants as its companions.

Mr. Vivian writes that the *Gunnera* was twelve feet high when the photograph was taken, and as the leaves are probably fully ten feet in diameter, the magnificent appearance of this specimen, in its beautiful setting of feathery foliage, is easily imagined. I have seen great masses of this *Gunnera* in some parts of Ireland, where the leaf-stalks were high enough to enable a tall man to walk erect among them without touching the blades. In the garden of the late Sir George Macleay, at Pendell Court, in Surrey, there used to be a very fine specimen of it growing on the edge of the lawn, where it dipped to the lake. *Gunneras* must be planted in such a position if they are to do well. A sheltered place, near water, where the soil is deep and rich, and where the sun can shine upon the plant all day is the right position for both *G. manicata* and *G. scabra*.

The history of *Gunnera manicata* was told by Mr. J. G. Baker in the *Gardeners' Chronicle* in 1886. It was discov-

ered in southern Brazil by Libon in 1865 and distributed by Linden, the Belgian nurseryman, in 1867.

It differs from *Gunnera scabra*, which is a native of Chili and Bolivia, in being more robust, with broader, more elegant and more spiny leaves and in having much taller flower-spikes. Where there is room for both, both are worth growing, but if only one *Gunnera* is wanted, then *G. manicata* is to be preferred. According to Mr. Baker, *G. chilensis* is an older name for the plant generally known as *G. scabra*, which has been in cultivation since 1849. I have seen the Kew specimen of this a mass of big leaves fifteen feet through and eight feet high, the leaf-blades being over four feet across. This, however, is dwarfed by a specimen of *G. manicata* seen by Mr. Burbidge in County

on the high mountains of Imeretia, in upper Mangrelea, and other parts of the Orient, where it replaces the Spruce of central and northern Europe, and often forms vast forests. From other Spruce-trees it may be distinguished by its more slender branches and by their dark green crowded leaves that cover them. The habit of cultivated trees as they appear in this country is particularly graceful and attractive; the long upward sweep of the lower branches and the spray-like branchlets standing out freely from the dark body of the tree and allowing opportunity for a free play of lights and shadows, give a charm to the Oriental Spruce which no other hardy Spruce-tree possesses, and at once attracts the eye and excites the imagination. The first Oriental Spruces planted in the United States are thirty

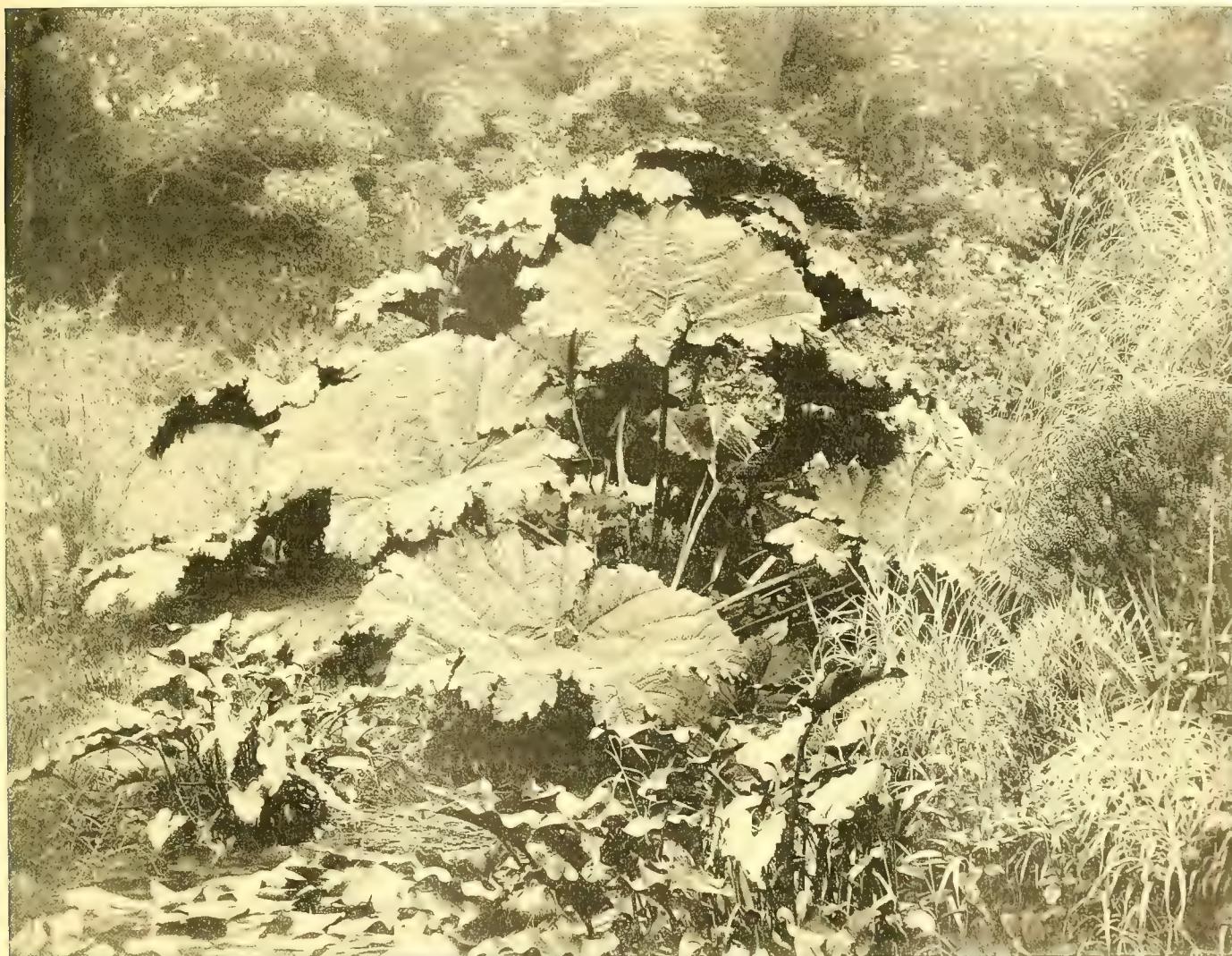


Fig. 8.—*Gunnera manicata*, in Cornwall, England.—See page 54.

Down, Ireland, which had twenty-five leaves, the stalks as thick as a man's arm and six feet high, the diameter of the whole being thirty-five feet, that of the largest leaf-blade ten feet three inches. In Guernsey there is a long ravine through which a stream runs, and which is entirely filled with this *Gunnera*, it having become naturalized there.

London.

W. W.

Plant Notes.

PICEA ORIENTALIS.—Of the evergreen trees from foreign countries that have been planted in the northern Atlantic states, no other, perhaps, is so full of promise as a permanent inhabitant of our parks and gardens as this species. The Oriental Spruce is a large and common tree in many countries adjacent to the Black Sea, or the Anti-Lebanon,

or forty years old, and are now more than fifty feet tall, so that while we do not know it yet in its adult state, and cannot determine whether old trees will be as beautiful and satisfactory as young ones have proved to be, it is safe to say that this tree is perfectly hardy from Boston to Philadelphia, and that it will retain its beauty for half a century at least. Of rather less rapid growth than the Norway Spruce and several of our American species, it is particularly suited to decorate lawns and small pleasure-grounds, and it is remarkable that it is so little known and so rarely planted. Good specimens of the Oriental Spruce can be seen in Central Park in this city, and there are several unusually fine ones in Prospect Park, Brooklyn. One of the oldest and best of these trees in the country stands on the grounds of Mrs. Rufus Leavitt, at Flushing, Long Island, and, of course, there are good trees in the collection of Mr.

Josiah Hoopes, at West Chester, Pennsylvania; at Wodenethe, Fishkill-on-Hudson, and in Mr. Hunnewell's Pine-tum at Wellesley, Massachusetts.

HIBISCUS SYRIACUS.—The best forms of this interesting and very variable shrub are not always planted in gardens. Many of the forms seen in northern gardens are those with double or semi-double flowers of mixed colors. These are somewhat more lasting than the single-flowered varieties if the length of time that individual flowers remain in good showy condition is considered. The single-flowered original species and its single varieties are, however, much more desirable, as they are more purely beautiful. The species varies greatly in the color of its flowers, there being white, purple, red and other shades; one of the most interesting has large rosy purple flowers with a crimson centre. These single-flowering plants bear seed in abundance, but it often does not mature well in northern gardens. Seedlings of varieties show some variation, especially where several kinds are growing together, but as a rule a particular variety will reproduce itself from seed. Where it is desired to get the exact counterpart of some particular plant it is best to propagate by layers, by cuttings of green wood taken in right condition in July, or by cuttings of ripe wood taken in the autumn or winter, and stored in moist sand, and started either in the greenhouse or open air. In localities where the Hibiscus is not very hardy it may be planted with the main roots in two opposite directions, and in the autumn the soil at one side of the stem may be removed and the plant bent at right angles to the line of the roots and covered with soil if necessary. Or it can be grown in a tub, and be transferred to the pit or cellar in winter. The greatest horticultural merit of these plants rests in the fact that they are showy late-summer bloomers, keep up a succession of flowers for a long time and thrive in a city atmosphere where many other kinds of shrubs would fail. They will flourish in a great variety of soils and in cold climates, but do best in a dry, rather than a wet, situation.

CLEMATIS INDIVISA.—We have lately seen long flower-covered stems of this plant used with charming effect in the decoration of the walls of a ballroom. An inhabitant of New Zealand, where it festoons trees and shrubs on the borders of the forest, *Clematis indivisa* must be grown in the northern states in a cool greenhouse, and succeeds best when planted in a border of well-drained soil and allowed plenty of head-room in which to produce its long flexible branches, which are covered in January or February with axillary panicles, often a foot in length, of flowers two inches or more in diameter when expanded. The beauty of their creamy white sepals is enhanced by contrast with the bright yellow filaments and purple anthers of the stamens. The plant ought to be a real addition to California gardens, where it is probably known, and eastern florists with large houses at command might grow it advantageously for festal decoration, which every year in all American cities makes larger calls upon their skill, resources and taste. An illustration of this plant was given in this journal (vol. vi., page 167).

CYPripedium SALLIERI ROEBLINGII.—As long ago as 1878 a hybrid obtained by fertilizing *Cypripedium villosum* with the pollen of *C. insigne* Maulei flowered in England, the cross having been made by Mr. Seden, who succeeded Dominy at this work in the Veitchian Nurseries. Seven years later, or in 1885, another hybrid between *C. villosum* and *C. insigne* was raised by Monsieur Godefroy Lebeuf, of Argenteuil, and was named *C. Sallieri*. According to the laws of nomenclature which now prevail, *C. Sallieri* ought to rank as a variety of *C. nitens*. Among the other hybrids obtained by crossing different varieties of these two species the one noted above is conspicuous for its beauty. The seed parent was a fine variety of *C. villosum*, and the pollen parent was the variety *Amesianum* of *C. insigne*. The seed was sown at the United States Nurseries on the second of October, 1890, and it first flowered in November, 1894. The plant has a bold habit, with dark

lanceolate leaves about nine inches long and one and a half inches across. The dorsal sepal is large, elongated, recurved at the base. The upper part is white, and the lower portion is yellow, heavily marked and spotted with purple-brown. The petals and pouch are a brownish yellow, the staminode is a bright golden yellow. It seems altogether a very desirable plant, and has been named in honor of C. G. Roebling, Esq., of Trenton, New Jersey.

Cultural Department.

Treatment of Amaryllis.

IN visits to other gardens it is noticeable that the Amaryllis or Hippeastrum is more generally cultivated than heretofore. This is not surprising when one considers how easily they are grown, and the great improvement that has taken place of recent years in such strains as are sent out by Messrs. Veitch and others. Some visitors who were here recently were most enthusiastic in their praise of the display of Hippeastrums at the Chelsea Nurseries. The question was asked if they did not take a great deal of heat, and it was a surprise to them to find in the coolest house over one hundred flowering bulbs that had been raised from the strain they had admired when in London. We are trying a few this winter in the cellar to see whether it is possible to keep them there when at rest, and the experiment so far seems a success. If they can be kept in a cool cellar after the foliage has died off it will be a great gain of storage-room in the greenhouse.

It has been noted previously that the best way to obtain a good strain of Hippeastrum is to sow seed as soon as it can be had fresh, which is in August. As the germinating power is soon lost, it is best to wait until fresh seed is harvested, when it should be sown as soon as it arrives. If this has already been done, the young bulbs must be grown on without any check until they are two years old. The foliage will then dry off naturally, and the bulbs will be best kept perfectly dry, until there are signs of growth in the early months of the year. We have already picked out a few that were starting to throw up flower-spikes, but the majority of them are still at rest, and will remain so as long as we can keep them dormant, for we want them most during May and later.

After the bulbs reach flowering strength they are as truly deciduous as a Hyacinth, losing both foliage and roots each year. They must of necessity be potted in new soil as soon as signs of growth commence, to avoid check to the young roots just starting out. After potting, a warm greenhouse is all that is needed to keep them growing until the warmer days of spring have come. After flowering we put them in a frame out-of-doors to mature the growth, and give them all the sun and air in summer, since, being natives of South America, our sun in summer is not too much for them, and serves well to ripen and insure a good bloom the next year. It will be seen that it is necessary to grow these bulbs in the greenhouse on stages for three or four months only; the space occupied during that time is not such a great consideration when we take into account the decorative uses of the plants when in bloom. The most suitable soil is one that is rich and porous; we use charcoal freely, and loam, leaf-mold and a little manure, preferably that from the sheep-pasture, seems to suit them best. The bulbs should be potted in the soil to about half of their depth, leaving the upper half uncovered.

Thrips are the only enemies of these plants that seem to trouble the cultivator, and their ravages are soon apparent by the red color of the under sides of the foliage. We use Fir-tree oil to spray with when it is too late to apply tobacco-dust as a preventive; but it is best to keep a sharp watch and take this pest in time, when tobacco will be found an effective remedy.

Amaryllis aulica has been used as one of the parents of some of the garden Amaryllis, with the result of a tendency in the plants to be evergreen. This is a disadvantage if the bulbs have to be stored under the benches, as these need a good light in winter. Many of the evergreen sorts are good, but they are excelled by those that have been obtained from the deciduous species, such as *Hippeastrum vittatum*, *H. equestre* and *H. reticulatum*.

It is too often the case that a plant after it has bloomed is put in some out-of-the-way corner, and left there until the time comes to store it for the winter. But a glance at the bulbs after they have flowered will show that they are shrunken to about half their normal size, indicating loss of tissue. To replace this the plants should be plunged into some material

to keep the roots cool and moist until the time comes to dry them off in fall. A spent hot-bed, old mushroom-bed material, or even leaf-mold, answers well, and there is not so much labor needed to water when the pots are plunged.

We find that very few bulbs need a pot larger than six inches. The young offsets that form after the bulb reaches the flowering size are taken off at each annual potting when they are large enough. Several of these are put in a pot and grown on until they are large enough to bloom. Sometimes an unusually large bulb is put into a seven-inch pot, but the majority are grown in the smaller size, which is sufficiently large and more easily handled than are the larger pots.

South Lancaster, Mass.

E. O. Orpet.

Sweet Potatoes from Slip Seed.

IN many parts of the southern states the growers of Irish potatoes find that they have the best success with that crop when second-crop seed is used. The potatoes are planted early in the season, and when mature the tubers are planted and a second crop produced. This second crop, which matures late in the fall, is in great demand for planting the following season, as the tubers produce strong, healthy plants, which yield much more abundantly than do those of the first crop when kept over for seed.

Growers of sweet potatoes in Virginia find that by using what is known as "slip seed" they are able to secure a much larger crop of roots, which are of much better quality than those from the sets ordinarily used. It is also claimed that the use of slip seed produces crops that are free from injury by the disease known as black shank.

Slip seed is grown from cuttings about six inches long taken during the latter part of June or the first of July from the vines in the fields. These cuttings are at once planted in the same manner as are the rooted plants which are used earlier in the season for the main crop. The cuttings produce tubers which compare favorably in size and yield with those grown from sets, and when used as "seed" these tubers produce a greater number of stronger and healthier plants than those grown from rooted plants earlier in the season. The demand for this seed is increasing every year, and the production of this slip seed is becoming quite an industry in many sections.

Experiment Station, Newark, Del.

M. H. Beckwith.

Chinese Primroses.

FOR the past two years we have grown for trial and selection a collection of Sutton's well-known strain of Primulas. Each year we have made notes of the kinds as they flowered, so that the best could be selected for our purpose, both as to boldness of stem, large flowers, good colors, and, most important of all, good habit of growth. The first thing noticeable was the failure of the double-flowered kinds to come up to the required standard. The flowers were of good colors, double, and free-blooming, but there was not that individuality about them that we get in the good strains of single flowers. Their use as decorative plants was of correspondingly less value, and we shall in future grow no more of them. Another defect in the so-called giant strains was the sacrifice of other points to the production of very large flowers. The foliage was in nearly every instance coarse and ill-balanced, and the stems rarely carried the flowers erect as in the other strains, owing to their abnormal size.

Of the other sorts we have, however, selected a few that seem to be as near perfection as it is possible to get them. It used to be a recognized fact that Primulas with leaves and stalks of a red tint were sure to bear colored flowers, but this is changed now, and some that have red stems produce pure white flowers of sterling merit. At the top of the list we place Sutton's Purity. This sort has Fern-leaf foliage of a dark purple hue that sets off the large pure white flowers to great advantage. I have never seen flowers of any Primula that can compare with this kind for size, substance and purity, and we shall grow no other white variety, except a few plants of Pearl; the latter is a fine selection of the old variety *Alba magnifica*, and has similarly green foliage. The pink colors we have sifted down to Rosy Queen, a Fern-leaf, compact-growing and very free-flowering variety that has flowers the color of the Grace Wilder Carnation. It has entirely superseded the older and well-known Reading Pink, owing to its delicacy of color and free growth. Reading Blue is still the best Primula of that shade, and it is of a more decided lavender-blue each year. We have never had this sort so good as during the present season, owing, perhaps, to the cooler temperature in which it was grown. We find that a temperature of forty-five to fifty

degrees is better than a higher temperature for the full development of the rich colors and to give substance to the flowers. For a good scarlet we have selected Reading Scarlet as one of the most reliable and the richest-colored. It has, however, the tendency to come into flower early in the fall, and we, therefore, sow it a month later than the other kinds, say at the end of April. The other sorts are sown in March, except the blue one, which is more delicate in constitution and takes longer to develop. It may be sown in January, or early in February, if large plants are desired for next fall.

There are few winter-blooming plants that give more satisfaction than Chinese Primroses, whether for conservatory or house decoration, if a good strain of seeds can be had. Choice Primulas are no more difficult to grow than poor ones, and take no more time and care. We use a light, rich soil at all times, making it a little richer at each potting, until the plants are in the pots they are to flower in. A five-inch pot will produce a good plant, but a size larger is preferable, and if very large plants are required an eight-inch pot can easily be filled by the larger ones before winter sets in. Primulas sometimes get what the older gardeners call water-pot fever; their susceptibility to overwatering is the only drawback to their cultivation, but this is easily overcome by a little care. A slight shade is necessary in the hot months of summer, and plenty of air while the nights keep warm.

South Lancaster, Mass.

E. O. Orpet.

Meetings of Societies.

Nebraska State Horticultural Society.—II.

WE continue our report of the annual meeting of this society by giving abstracts of a few of the addresses and discussions on the cultivation of Cherries and Plums.

THE CULTIVATION OF PLUMS.

Mr. E. S. Hartley's experience with this fruit may be summed up as follows: "The first crop I marketed paid the entire cost of my Plum orchard up to that date." He thought that this fruit offered a more promising field for experiment than most other branches of pomology. He had fruited two hundred seedlings, and the result showed a marked tendency among American Plums to vary. We give condensed extracts from Mr. Hartley's address:

In 1888 I planted 240 trees, but many of them were untrue to name, and therefore my venture has proved less satisfactory than it should have been. However, 140 trees bore full crops last season, six years after planting, and we marketed them at an average price of \$1.50 a bushel, or at the rate of \$150 an acre. Plum pockets began to appear about the time of blossoming, but these were hand-picked and burned. Sprouts were gotten rid of by horse-power, an attachment having been made for the cultivator which shaved them off about an inch and a half or two inches below the surface. By another device the plums were conveyed to the marketing boxes without touching them with the hands, the whole crop of a tree being transferred to the boxes in about ten minutes. This device consisted of a canvas buttoned about the tree into which the plums were shaken somewhat on the principle of the Cook apple-harvester.

One of the chief difficulties in estimating the value of new varieties is to determine the influence of the stock upon the cion, which seems to be very marked in the case of the Plum, both in the quality of the fruit and the abundance of the product. For instance, De Soto on Miner stock has proved weak and barren, and seems to lack nutrition. The same variety on roots of *Prunus Americana* is very productive, and a healthier tree. Varieties of *Americana* and *Chickasaw* have been reported to do well on Peach stocks. Myrobalan, Marianna and the Sand Cherry, as stocks, are alternately praised and condemned, according to the cions which are put into them. For this reason it seems necessary to plant the same Plums on different stocks until their effect is better understood.

The improvement of the native Plums is still in its infancy, as compared with the development of other fruits. I believe the possibilities here are very great, both in the improvement by selection, natural pollination and artificial hybridizing between native varieties and European and Japanese varieties. The time is not far distant when the plum will outrank the cherry as a useful and popular fruit, and rival the peach and pear in popularity. We are in a region specially favorable for the development and growth of the Plum. The seasons of 1893 and 1894 have demonstrated the ability of the Plum to withstand drought exceptionally well. The driest year known in this section of the country has produced the largest crop of

plums. In the effort to improve our Plums by cross-breeding we will doubtless achieve better results by resorting to the Japanese varieties, since they possess some desirable characteristics which the European Plums do not, particularly vigor and productiveness. So far as tested, these Japanese varieties give satisfaction in the west. Some of them have withstood a temperature of thirty-seven degrees below zero at Geneva, Nebraska, without the slightest injury. By watching them side by side with our hardy natives the past four years and witnessing their splendid behavior, I have been forced to the conclusion that there is a close relation between our natives and these Japanese introductions. In their large size and fine qualities lie the condensed improvements brought about by, perhaps, thousands of years of selection, while our natives have been left to improve under the operation of the law of "the survival of the fittest."

In the discussion that followed, Professor Hansen, of the Iowa Agricultural College, called attention to the fact that the Japanese varieties bloom so early that they are often caught by a frost which other varieties may escape. Burbank is the hardiest Japanese variety at Ames. Of the east European varieties, Moldovka and Voronesh Yellow are doing finely. Wyant is the most reliable native sort. At the college they propagate all Pears and Plums by side-grafting at the collar during the winter.

Mr. Masters called attention to the fact that the budding season of the Americana stock can be lengthened by cutting off about half of the top when the bark begins to set. Then, when the new sprouts begin to start, the budding can be continued without difficulty. This point is important since one of the great objections to this stock is that its season of budding is so short. Nurserymen seem to agree that there is not a satisfactory stock for the Plum in general use, and they are anxiously waiting for something better than they now have.

EXPERIENCE WITH CHERRIES.

President F. F. Stephens stated that he had planted somewhat freely for the last twenty years, and had not succeeded in raising a bushel of sweet cherries, though he had planted a great many varieties. Napoleon Bigarreau has seemed the healthiest of the sweet varieties, but only one tree remains sound, and, while that blossoms freely, it has not yielded fruit, though the tree is five or six inches in diameter. Neither have the Dukes given success, although the May Duke has come near to succeeding. These trees remained alive till they were six inches in diameter, but the birds invariably gathered the fruit. They are at work earlier in the morning than he is, and begin to pick as soon as the fruit colors. The gentleman of leisure may protect his fruit by covering the tree with netting, but whether this will ever pay on a commercial scale at Nebraska prices is doubtful. It seems wiser to plant enough for the birds, our neighbors and ourselves, and this planting should be of varieties that yield abundantly and ripen in a comparatively short time. In 1891, in Mr. Stephens' orchard, it took 100 bushels to feed the pickers and the birds, or one-eighth of his crop of 800 bushels, yet he dare not dispense with the birds lest a worse trouble come upon him, for in the rapid increase of insects the birds will doubtless fully repay for the toll they take from our fruits.

In varieties the Early Richmond easily leads all others. The quality of Late Richmond is good, but it fails in productiveness. In place of this the large Montmorency is recommended, with the Osheim and English Morello. The latter, however, like all late cherries, is less desirable, owing to its longer ripening period and consequent greater injury from birds. The Russian varieties seem to be open to the same objection, and, in addition, are lighter yielders. They are harder in tree and bud, however, and may prove valuable for the north-western part of the state. The Vladimir cherries reproduce themselves from seed, and are likely to prove valuable in especially trying localities.

Good growth and abundant feeding make a marked difference in the quality of the fruit. Even the Early Richmond, when receiving high cultivation, and heavy manuring after it comes into bearing freely, becomes a larger and much richer cherry, and would hardly be recognized as the Early Richmond. Deep plowing before planting, steady surface cultivation in the orchard and heavy surface manuring after the trees come into bearing will improve any of our varieties in a surprising degree.

Mr. D. N. Reed, of Blue Springs, Nebraska, has a Cherry orchard of seventy-four trees. The first Richmonds ripened about June 1st, and a crop of 2,160 quarts was marketed from

fifty-four trees, or an average of forty quarts a tree. The remainder of the orchard gave an average of thirty quarts a tree, making the total yield from the seventy-four trees 2,660 quarts, which found a ready sale at eight and one-third cents a quart, or \$212.80. One acre planted to Cherry-trees sixteen feet apart requires 170 trees, and, using the yield for 1894, would give in value \$488.75 an acre. With the varieties now fruiting Mr. Reed has ripe fruit on the trees for about two months. The best variety in quality, by all odds, is the one supposed to be Early Morello. This ripens three or four days after the first Early Richmond; is a black cherry; meat and stone colored red to the seed. It commands a ready sale, customers asking for the black cherry. The tree is a good grower and as prolific as Early Richmond, and fully as hardy on our grounds. Next in quality and season is Large Montmorency, closing up the gap between Early Richmond and English Morello. This is a better cherry for eating from the tree than Early Richmond; as good a grower and as prolific. Mr. Reed also finds this fruit to respond quite as promptly to good cultivation as any other fruit, and more certainly than most fruits. The last two summers have proved—in Nebraska and Iowa, at least—that orchards must be cultivated to keep in health, and thus get growth of wood and fruit-buds; for without wood-growth there will be but few buds. That cultivation is the next thing to rain was demonstrated in many instances last year.

Mr. Peter Youngers said that by planting Dye House, Early Richmond, Early Morello, Large Montmorency, Osheim, English Morello and Wragg a constant succession of fruit may be obtained in Nebraska from June 5th to August 5th—two full months of ripe cherries. This list, compared with one made in 1874, is remarkable; at that time the Early Richmond was the only Cherry considered safe to plant. But the cause of horticulture has advanced in twenty years until, instead of one variety, two full months of this wholesome fruit can be had. And with the new additions from Russia and Germany, together with the new seedlings that are now in process of development, Mr. Youngers felt assured that the gain in the future would equal that of the past, and when the list of the best market sorts of cherries is called for twenty years from now it will cause the old members of the Nebraska Horticultural Society to feel that they were not born in the cherry age.

Professor Hansen considers the Mazzard to be far the best stock for the Cherry, notwithstanding the fact that the Mahaleb is the one almost wholly used throughout the west. The cherries with colored juice, especially, do not succeed well on the Mahaleb stock. There seems to have been a general fear of the Mazzard stock on account of its sprouting, which is, perhaps, aided by the nurserymen, since they find the Mahaleb the most convenient stock to work. The Sand Cherry has proved a failure as a stock for the Cherry, but is a good stock for the Japanese Plums. It seems to be more closely allied to the Plums than to the Cherries.

Western New York Horticultural Society.—II.

THE following is a continuation of our report of the annual meeting of this society :

HOME-MIXED FERTILIZERS.

Dr. Caldwell, of Cornell University, in an address on this subject, said that a "cheap thing" in fertilizers was quite unsatisfactory as other cheap things. The composition of commercial fertilizers is usually given in per cent. Available fertility is rated by units in the trade, and a unit is twenty pounds, so that the figure denoting the per cent. gives us the number of units of the potash, phosphoric acid or nitrogen in a ton. The price of a unit is twenty times the price of a pound, which means for nitrogen \$3.50, for phosphoric acid \$1.30, and for potash \$1.00. Most of the cheaper grades of fertilizers are sold for more than they are worth, while the better grades are sold at their actual value, or a trifle under. In New Jersey last year 700 tons were home mixed at an average cost of \$29.70 a ton, and an average value of \$49.27. The farmers bought high-grade fertilizers intelligently, not hit or miss. The average cost of a pound of nitrogen, phosphoric acid and potash respectively, in the home-mixed fertilizers, was 14.9 cents, 5.7 cents and 4 cents, while in manufactured goods it cost 24.8 cents, 9.4 cents and 6.7 cents. The available food was 436 pounds to the ton in the home-made fertilizer, and only 299 pounds in the manufactured.

The manufacturer claims that he can do the mixing better than the farmer. The farmer can buy the goods ground as finely as he wants and mix them as thoroughly as the manufacturer, as is shown by the comparison of twelve samples of manufactured articles with ten of home-mixed. The impor-

tance of thorough mixing depends on the solubility of the plant-food. If the water dissolves it as soon as it goes into the soil, then that distributes it more efficiently than can be done in any other way. This solubility affects the nitrogen most, and this is the constituent which the manufacturers claim they can furnish in better condition than the farmers can. In the home-made fertilizers seventy-two per cent. of the nitrogen was available, while only twenty-eight per cent. was available in the manufactured fertilizers. Of the home-mixed material only twenty-eight per cent. needed to be made fine and mixed thoroughly, while in the manufactured article seventy-two per cent. required such treatment. Sixty per cent. of the price of average fertilizers is paid for nitrogen. By the proper growing of certain Leguminous crops much of this may be saved.

The farmers of New Jersey who have been doing so much of this home-mixing feel satisfied that the results are better and cost less than their former practice. Of course, each man must experiment on his own land by excluding one plant nutrient and thus ask if his land wants this, that or the other of these three important constituents. It is bad practice to be stingy with applications of fertilizers. It should be remembered that there are three and a half million pounds of soil on an acre, taking one foot in depth, and then one can estimate how small an amount of food 700 pounds to 1,000 pounds of fertilizer will furnish when it contains only five per cent. of nitrogen, ten to fifteen per cent. of phosphoric acid, and ten per cent. of potash.

THE EVOLUTION OF TILLAGE.

Professor Bailey began his address on this subject with the statement that tillage, as we understand it, was not known till two hundred or three hundred years ago. The physical necessities of killing weeds, putting in the seeds and getting the crops out was all that was aimed at. Two hundred years ago Tull observed the tillage of vineyards in the south of France, and as a result published a book in 1733 known as *Horse-hoeing Husbandry*. His theories were that by tillage soils might be forever reinvigorated and renewed. Some thought the necessary elements for plant-growth were nitre, water, air, fire and earth. Tull ruled out the air. He said that the plant is earth. He thought they fed on earth, and hence it was necessary that it should be finely divided, so it might be taken up by the mouths of the roots. The value of ashes was entirely due to their fineness. He observed also that tillage made the soil moist. He thought the moisture came from the air.

We have now learned to till for the sake of tillage. At Cornell, Tull's system of growing Wheat in rows and cultivating has been followed by taking a piece of ground and dividing it into strips five and a half feet wide and planting alternate strips each year with Wheat, and keeping the vacant land cultivated. The result is as heavy crops as the average ones of New York state the last five years on the same piece of ground.

By failing to cultivate well, farmers are borrowing money when they already have a lot in bank not drawing interest.

The failure of apples is due to the neglect orchardists have shown for the last twenty-five years, and now they are reaping the harvest. They should use the deposit in the bank first; get the most possible out of the land by tillage. Some hold three or four years of such treatment to mean failure afterward. But we need not expect to correct the wrongs of a quarter of a century in three or four years. Nine-tenths of all the orchards in New York are in grass, and half of these yield annual crops of hay. We are hunting fungi with spray guns and forget to feed our crop-producers. If an orchard is worth planting it is worth caring for.

It is impossible to begin cultivating an old orchard because the roots have come to the surface. In Erie County, on a light soil, one grower had plenty of berries in a dry year by keeping the soil in good condition by cultivation. He held the moisture from the rains by constant cultivating so as to interrupt and break the capillaries which drew the soil-water to the surface, where it evaporated and was lost, and at the same time he spread over the land a porous blanket two or three inches thick. In the Pecos Valley, now becoming famous, the yearly rainfall is five or six inches, but they keep it all by cultivation, and yet here we are complaining of trees shriveling and drying up with forty-eight inches rainfall.

All the growth of an orchard should be made by August. The rule should be to begin early, plow deep, and follow rains closely with a cultivator. He had found roots of two-year-old Plum-trees eight feet from the trunk, while the top only extended four feet, thus showing that the root extended farther than the top. In the early part of the season the tree-roots

catch food, while later the trees should be checked by Crimson Clover, which takes the available food and moisture, and gathers food into a better shape for trees. It should be sown in August, but it ought to be either long before or after the fruit is gathered.

Pruning is a means of tillage; it concentrates food in a short space. After all this has been done, then spray. When an orchard in sod is doing well it merely shows that the land there has superabundant fertility. Half of the old orchards should be cut down. Those which cannot be plowed should be dragged and have an application of 500 pounds of superphosphate and half as much potassium chloride to the acre. Feed the crops, not the land; apply 200 pounds every year, not half a ton every five years.

In the discussion which followed this paper, Mr. Tabor suggested that cultivation may stimulate the production of trees, rather than of fruit, tending to push the tree with the greater amount of nitrogen it secured as food. An orchard in Dutchess County was thoroughly cultivated and dressed with 1,500 pounds of bone and 500 pounds potassium chloride. Another had a good dressing of stable-manure. The orchard treated with potash and bone gave glossy, firm, high-colored apples, while the one dressed with barnyard-manure gave larger, but less highly colored, apples, which shrank more, and did not carry to England as well. He thought the nitrogenous manure keeps the wood growing late, so that it does not ripen well, and immature buds mean poor fruit. To this Professor Bailey replied that he would supply potash and phosphoric acid, but would not buy nitrogen. Sometimes, when lands are rich in nitrogen, and an orchard is too rankly growing, then seeding it down to grass might be its salvation. This, however, is a special case; as a rule, cultivation is better than grass.

A THOUSAND DOLLARS AN ACRE FROM BLACKBERRIES.

This was the rather startling title of a paper read by Mr. C. E. Chapman, of Peru. In recounting his experience Mr. Chapman said that he had heard that Blackberries would grow anywhere, and he, therefore, bought some plants of Kittatinny, took no particular pains to set them, and many died. He used on the ground a quantity of raw, coarse manure, and the next year many of the canes broke. He then concluded that to grow Blackberries required some study. As a result of the study he prepared a piece of chestnut loam, put it in prime condition, bought some plants of Agawam and Snyder from good, careful growers, at prices that would warrant him in expecting good plants. He set them carefully in trenches seven feet apart and eight inches deep in the trench. He found these varieties deep-rooted and thrifty, and where mulched, pruned and not fed too much raw manure he had little trouble from winter-killing. When setting his plantation he applied eight hundred pounds of potash to the acre. He was careful to have all plants well set, and he frequently clipped the tops. All weak canes were cut out. Every spring he applies a light dressing of commercial fertilizer. Immediately after fruiting he cuts out and destroys all the old canes, as these are the seat of nearly all the troubles of this fruit. During the winter he mulches heavily and leaves the mulch on late in the spring to prevent early starting.

Although he did not believe a thousand dollars an acre could be realized under ordinary conditions, yet this was an achievement worth striving for, and small patches had been made to yield at that rate. It required the right combination of man, soil, variety and cultivation, but it could be done.

Crimson Clover was much talked of at this meeting, as it always is nowadays at any gathering of farmers or fruit-growers, and it was suggested as the best crop to cover the ground in winter and catch nitrogen, because it will grow all through the winter and be ready to plow under in the spring. There is danger of its dying as far north as New York state, according to Professor Waite, who said it had been killed out near Washington by a temperature of six degrees below zero. This may have been due, however, to the warm weather preceding it. Professor Bailey said it had not been winter-killed in New York during the last three years when raised from home-grown seed. Dr. Caldwell spoke of it as a quick-meal crop, and valuable because it worked when nothing else could, and his advice was to secure nitrogen by some leguminous crops, and apply phosphoric acid and potash, trying every possible combination. The nitrogen in dried blood or in bone-meal could be used any time in the year, but sodium nitrate could only be applied about the time of sowing or after a crop was under way, so that it could be taken up at once by the plants before it leached out and ran to waste.

Notes.

Between sixty thousand and seventy thousand bulbs of Japanese Lilies were disposed of at a single auction sale in London last month.

Mr. J. H. Hale writes to the *Florists' Exchange* of a new large winter pear in form like Vicar, but with a color as beautiful as that of the Bartlett and of quite as good flavor. The stock is owned by E. G. Mendenhall, Kinmundy, Illinois. A really first-class winter pear of this color and description would be a desirable acquisition.

A correspondent of the *Rural New Yorker* writes that after freezing weather set in last fall he planted all his Cauliflowers which had not headed in a trench and covered them with leaves. They continued to grow. Now the leaves are as green and crisp as they were in September, and every plant has formed a fine head. There seems to be no reason why Cabbage and Cauliflower which have not matured in autumn should be allowed to waste.

At the late meeting of the Royal Horticultural Society, in London, Mr. May's new Tea Rose, Mrs. Pierpont Morgan, which we have already described as a sport of Madame Cusin, received an award of merit. The fragrance of the flower was spoken of as one of its distinct features and as delightful as that of any Tea Rose known. It certainly speaks well for the flower that it preserved its fragrance after a journey across the Atlantic before it was exhibited.

At the late meeting of the American Pomological Society at Sacramento the Wilder silver medals were awarded: To the Coöperative Fruit Company of Newcastle, Placer County, California, for oranges, lemons, pomelos, Japanese persimmons, apples, figs and almonds; to the California Nursery Company, for sixteen varieties of olives on branches. Bronze medals were awarded to the Pioneer Land Company, Porterville, for ten varieties of oranges, pomelos and limes; to P. C. Drescher, of Palermo, for sixteen varieties of oranges; to the Horticultural Society of Sonoma, for Luther Burbank's improved nuts and other fruits.

An English traveler in northern Russia writes to the *Gardeners' Chronicle* that nothing surprised him more than the universal presence of well-grown flowering plants in dwelling-rooms. Even in the cells of monasteries and in the studios of city photographers farther north than Archangel he found such plants as Oleanders, Crotons, Pelargoniums and Fuchsias in almost every room. The double windows, so necessary to keep out the cold, have a draught-tight space between them filled with flowering plants, and it does not seem necessary to open them for air during the short hot summer. From September to June the country is buried in snow and shut in by ice. The average temperature for January is only ten degrees. The July temperature, however, has an average of sixty degrees, Fahrenheit, which is hardly to be wondered at when it is remembered that the sun shines twenty-two hours out of the twenty-four.

Mr. Thomas Meehan, in the last number of his *Monthly*, which contains a portrait of *Aquilegia Canadensis*, gives a very pretty description of a scene in spring along the Wissahickon, in which this wild Columbine was an important feature. It was twenty-five years ago, before the city, with its army of flower-gatherers, had crowded so far out into the country, when this plant was seen among the loose rocks at the base of a huge crag with blue Hepaticas, Spring Beauties and the snowy flowers of Blood-root mingled with the vivid color of the evergreen Fern, *Aspidium acrostichoides*. Up in the crevices of the crag *Corydalis glauca* was blooming profusely in the midst of tufts of common Polypody, while the trees and shrubs were just beginning to open their tender leaves, making a sort of half-shade which gives that peculiar charm to forest-scenery at this entrancing season of the year. The final charm to the scene was given by our wild Columbine, whose woody roots had descended deeply in the crevices of the rocks, where the leaves had been caught, to decay and make the rich food in which it delights. Why do not these plants make a nice list for a nook in some wild rock-garden for early spring effect?

We have heretofore given accounts of experiments to test the influence of electric light on plants growing in the greenhouse. The most important of these experiments were conducted by Professor Bailey, in which the arc lamp was used. In 1892 Professor Rane, of the West Virginia Agricultural Experiment Station, began some tests with incandescent lamps, although in the bulletin which recounts these experiments it is stated that in the arc light the chemical rays predominate, while in the incandescent light these are only slightly present,

and the supposition is that the light from an arc lamp contains properties which render it nearer sunlight in quality than that of the incandescent lamp. The results produced in the seasons of 1892 and 1893 were that the electric light had a marked effect on greenhouse plants, and appeared to be beneficial to such as are grown for their foliage, as, for example, Lettuce, which was earlier, weighed more and stood more erect. Flowering plants also blossomed earlier and continued in bloom longer under light, and most plants tended toward a taller growth. The influence of the light was objectionable in some plants, such as Spinach and Endive, as it forced them to run quickly to seed. The stronger the candle-power the more marked were the results.

Just now the stores of the retail florists are bright with an unusual number of cut flowers of different kinds, which show a wide variety of color. Single red tulips sell for \$1.00 a dozen, the more popular pink and yellow sorts commanding as much as \$1.25, while the double yellows cost \$1.50 a dozen, which is also the price asked for the few double pink tulips that have appeared. Other flowers of bulbous plants are single hyacinths at seventy-five cents a dozen, the limited supply of double hyacinths bringing thirty-five cents a stalk. Poet's narcissus are occasionally seen, and these sell for \$1.00 a dozen. Paper-white narcissus, yellow jonquils and freesias are seen in many collections. Well-grown lilacs, with luxuriant foliage, cost \$1.50 to \$2.00 for a bunch of ten to twelve single sprays for the purple flowers, and the white lilacs bring \$2.00 to \$3.00. The best carnations and a fair grade of mignonette cost \$1.50 a dozen. A bunch of two dozen sprays of forget-me-nots may be had for \$1.00, and half this quantity of lily-of-the-valley costs seventy-five cents. Roses are in great abundance, and vary in price, according to the quality, a great many of them being of more than average excellence. Good flowers of Madame Cusin bring \$2.00 a dozen, while the same grade of Bridesmaid, Bride, Catherine Mermet and Meteor sells for \$2.50 to \$3.00, and the better grades of any of these roses command \$5.00 and \$6.00 a dozen, and even more. American Beauties, with stems five feet long, bring \$1.00 apiece and upward. Cattleyas sell for \$9.00 a dozen and upward, and white varieties bring twice as much. Cypridiums are scarce, and cost \$4.00 to \$5.00 a dozen.

On page 344 of the last volume of this journal, Professor J. B. Smith, of New Jersey, gave an account of the way in which the San José scale was being brought into the eastern markets upon pears and, perhaps, on other fruits. In the last bulletin from the New Jersey Experiment Station, Professor Smith gives an account of the spread of this scale in New Jersey, where it was introduced upon Kelsey Plum-trees imported from California, and probably from Idaho Pear-stock received from western nurseries, and it has spread until it is known to have infested at least a hundred places in that state, and it is not safe to assume that it is absent from any orchard which has not been examined. This scale belongs to the group of armored scale insects, and a complete account of its life history and of its methods of spreading are given in this bulletin. Naturally it moves very slowly, but as it will crawl upon winged insects and the feet of birds, as well as upon ants, which are great travelers, it is sometimes carried great distances. It is probable that all Rosaceous plants will support the species, although it prefers some varieties to others. The recommendations in the bulletin are that every orchard set out during the last six years should be thoroughly examined, and if the scale is found to be present and confined to a few trees these trees should be taken out and destroyed, unless the infestation is slight, so that they can be gone over with a stiff brush and all the scales actually brushed off. In young orchards where the trees are not too large to handle it will pay to go over all the trees with a brush. Where the trees are too numerous or large they should be pruned back, removing as much wood as the tree can spare; the cuttings should be carted off and burned, and the tree should be washed with a potash solution. In California the insect is treated with gas which is formed by the action of diluted sulphuric acid on fused cyanide of potassium. This is not recommended for eastern orchards as the necessary outfit is too expensive, but wherever stock is infested in nurseries, or even suspected of infestation, all trees sent out should be made up in bundles with the roots wrapped to retain the moisture, covered with oiled canvas or other gas-tight material and fumigated for an hour, an ounce of cyanide to every one hundred and fifty cubic feet of space being used. This bulletin is worth careful study by all fruit-growers, since the San José scale is one of the most dangerous insects introduced into the eastern states within recent years, and no fruit-grower ought to consider the matter so unimportant that he can afford to neglect it.

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLE: —The Red Cedar. (With figure)	1
Black Locust in the West.....	1
California Experiment Stations.—JI.....	Charles H. Shinn. 62
NEW OR LITTLE-KNOWN PLANTS: —New Cypripediums.....	63
PLANT NOTES	64
CULTURAL DEPARTMENT: —Vegetables under Glass.....	M. Barker. 64
Violets.....	T. D. H. 66
Chrysanthemums.....	William Scott. 67
Winter-flowering Begonias.....	William Scott. 67
CORRESPONDENCE: —The Saghulin Knot-weed.....	Professor L. H. Pammel. 67
New Orchid Baskets and Plant Tubs.....	H. Nehrling. 67
MEETINGS OF SOCIETIES: —Nebraska State Horticultural Society.—III.....	17
Western New York Horticultural Society.—III.....	18
RECENT PUBLICATIONS	68
NOTES	69
ILLUSTRATION: —A Red Cedar in Eastern Pennsylvania, Fig. 9	70

The Red Cedar.

THE Red Cedar, which is not a Cedar at all in the botanical meaning of the word, but a Juniper, is one of the commonest and most widely distributed trees of North America. Indeed, it is not easy to recall any other coniferous tree which inhabits such an extended area, with the exception of another plant of the same genus, the *Juniperus communis*, found in various forms in all northern countries, and the great Siberian Spruce, *Picea obovata*, which ranges from the eastern borders of Russia to the Manchurian shores of the Pacific Ocean, and to central China. The Red Cedar is equally at home on the dry gravelly hills of New Brunswick and New England, on the northern shores of Georgian Bay, in the fertile valleys of Pennsylvania, on the limestone hills of eastern Kentucky and Tennessee, where it forms, with stunted shrubby growth, great forests or "Cedar Breaks"; in the swamps of the Florida peninsula, and on the rich bottom-lands of the Red River and its tributaries, where it grows to its greatest size. Less common in the west than in the east, the Red Cedar is apparently as much at home in one region as in the other; it is scattered over the eastern slopes of the Rocky Mountains of Colorado; and when the Mission of Santa Fé was established the Spanish priests might have seen it on the cliffs above the stream that enabled them to change a desert into a garden; it flourishes in northern Arizona, where the melting snows of the Rocky Mountains pour through the mighty chasm that divides the Colorado plateau, and it grows on the borders of lakes and streams in northern Montana and Idaho, and on Vancouver's Island.

The habit of the Red Cedar is as varied as the regions it inhabits. Sometimes it is bush-like, with many spreading stems, and at others it grows nearly a hundred feet tall, with a beautiful straight trunk four or five feet in diameter; sometimes all the branches are wide-spreading and form a symmetrical round-topped head; at others they are pressed close to the stem and the tree is pyramidal with a narrow spire-like top. These varieties of habit do not appear to be governed by any recognized conditions of environment. Often pyramidal trees grow side by side with round-topped or bushy ones, and in old age they all appear to lose their

pyramidal habit and to become round-topped. The pyramidal habit, however, is, perhaps, rather more marked and constant in fertile lands, such as are found in the valley of the Hudson River and in eastern Pennsylvania, than it is in New England, although pyramidal trees are common there. Of remarkable constitution and possessed of great powers of adaptability to varied climatic conditions, the Red Cedar only displays its full size and develops its greatest value in the warm and humid atmosphere of the south, and at the north and in the far west it looks as if it selected some particularly exposed and wind-swept hill for its home in order to show its toughness and indifference to the comforts of life.

The earliest European settlers on the Atlantic seaboard delighted in the Red Cedar, which reminded them of some inhabitant of their Old World gardens, and in its bright red fragrant wood which the Indians had known and valued before them; and the narratives of the old voyages and settlements usually describe the Cedar which was often included in the lists of treasures yielded by the new-found land. They did not exaggerate its value as they did that of the Sassafras and many other products of the American soil. There is no tree in America that will grow better fence-posts, for the wood does not decay and insects do not molest it. A well-selected Red Cedar post will last an incredibly long time in the ground; and for the sills of buildings placed immediately on the soil no wood is more valuable. Moths flee from its pleasant pungent odor, and every good housekeeper knows the value of a red cedar chest, or a closet lined with this wood. Red cedar is the wood of lead pencils; and practically the wood in all these indispensable articles, at least in pencils of good quality, is the wood of this tree from Florida, where there are great factories belonging to German manufacturers, devoted to cutting up cedar wood into pencil stock. Every artist in all the civilized world, every man of letters, every school-teacher, all the bankers, lawyers and other men of affairs, the men and women who control the world, and all the school-children who are going to control it, hold every day in their hands a piece of this wood. It would be interesting to know what proportion of these men and women, the most intelligent and best-educated of the human race, knows anything of the origin of these little cylinders of wood, of the character and appearance and of the name even of the tree that builds them up in its long life of slow accretions.

It is not our purpose to speak now of the botanical peculiarities of the Red Cedar, the *Juniperus Virginiana* of botanists, because they are perfectly well known to every one who is interested in trees in their scientific aspects, but of its horticultural or decorative value as an ornamental plant, because it does not seem to be fully appreciated or recognized in American plantations, at least in the eastern states, although in the west a few years ago it was largely grown by nurserymen and planted in considerable numbers on the plains and prairies of the Missouri River basin. In all the northern states the Red Cedar can be made to take the place in formal gardens of the Cypress, to which the gardens of southern Europe owe so much of their charm, and which cannot be grown in our severer climate. If it is desired to produce certain effects in a garden by the use of trees that are formal in outline, the Red Cedar will produce this effect better than any other tree that is hardy here; and if trees cut into fantastic shapes such as delight the Chinese or the Japanese, from whom the Dutch learned this fashion, no tree bears with less injury than the Red Cedar the annual suppression of its growth under the gardener's shears. In natural gardens also the Red Cedar can be made to play a useful, and sometimes an important, part, as no tree is better suited to enliven a broken, rocky hillside or to crown its top with its dark green foliage, which in autumn is studded with bright blue berries. Other coniferous trees with pyramidal habit, like the Arbor-vita, are often planted in such situations; but the Arbor-vita is a gregarious tree and an inhabitant of

swamps and low river-banks, and when it is made to stand out alone on a hill it never looks at home or in harmony with its surroundings, while the Red Cedar, of all our trees, most easily fits into its place in the landscape, and, perhaps, no one ever saw a Red Cedar that looked out of place in connection with its associates in any American sylvan landscape. As a hedge-plant the Red Cedar has not proved very successful; the plants grow too slowly for the impatient American, who wants his hedge to grow as rapidly as a carpenter could build one with boards, and the branches often die out, making here and there ugly gaps.

Like most other trees, the Red Cedar is easy to raise from seeds when the person who undertakes to do it understands its peculiarities. The stone enclosed in the fleshy berry of the Juniper is very thick and hard, and it takes a long time to soften so that the seed can get out and begin to grow. Planted in the ground in the ordinary manner a Juniper-seed will sometimes lie for years without germinating, and the way to treat them is to soak the berries thoroughly in warm water as soon as they are ripe in the autumn, mix them with sand, bury the whole mass in the ground in some place where they will keep moist during the following summer, and then plant them either in the autumn, a year from the time they were gathered, or in the following spring. Treated in this way the seed will germinate in a few weeks after they are planted, and produce strong plants the first year, which will be six or eight inches high at the end of the second season, and ready to transplant. Nurserymen do not raise Red Cedars very often now, for there is no great demand for them. Young plants can be transplanted from old pastures, however, or from the sides of walls or fences, where the seeds dropped by birds germinate in great quantities, producing the long lines of Cedar-trees which are conspicuous and beautiful features of the landscape in the northern and middle states.

The Red Cedar is a long-lived and hardy tree, and if any man has a fancy to plant for posterity or to preserve his memory in a tree, there are few trees that he can plant with greater assurance of attaining the object of his ambition.

The illustration on page 65 of this issue, made from a photograph, for which we are indebted to Mr. Charles S. Bradford, Jr., represents a venerable Red Cedar-tree of a common form growing near Wawa Station, Delaware County, Pennsylvania.

Black Locust in the West.

SO far as I know, the only place west of the Mississippi where Black Locust, *Robinia Pseudacacia*, is indigenous, is in Arkansas, where there is a heavy rainfall. But the species will flourish under widely different conditions of moisture, and it succeeds quite as well, even in high land, as any other tree as far west as the one hundredth meridian. It will not endure excessive cold, however, and it is not advisable to plant it north of central Iowa and the Platte River, in Nebraska.

Black Locust has been extensively planted in the prairie portions of Missouri, and in Kansas it is a favorite tree, owing to the great variety of soils in which it succeeds, its ability to withstand drought, and the superior excellence of its wood for post timber, and for all uses requiring contact with the soil. It is the hardest and most durable broad-leaved timber that can be grown in this climate, and as fencing is an important problem in the west, there is economy in including a good post timber in the shelter belt plantation. Black Locust seedlings have been extensively distributed by the Kansas Commissioner of Forestry. At the State Forestry Station, Ogallah (longitude $99^{\circ} 40' W.$), this tree is grown in high prairie, and trees seven years planted are as healthy as any on the grounds. The annual rainfall at Ogallah is about twenty-four inches. At the Kansas Agricultural College, Manhattan, Black Locust and Catalpa have been used as nurse-trees for Oaks. The Locusts have not done especially well in this mixture, growing about as rapidly as the Catalpa. The Locust is a

light-demanding tree, and should be planted in mixture with good shade-enduring kinds, such as Russian Mulberry and Wild Cherry. The trees should be set close—not more than four feet apart both ways, and three feet is better. This close planting will force them tall, and as in post timber length of trunk is a most important consideration, the importance of plenty of shade-making trees and close planting will be recognized. The Locust should not constitute more than one-fourth of the plantation. Mixed planting will also tend to lessen the danger of damage from borers, which cause much injury to trees of this species.

Washington.

Charles A. Keffer.

California Experiment Stations.—II.

THE Forestry Station at Santa Monica, in southern California, occupies a most interesting and picturesque site. The town of Santa Monica is, perhaps, as well known as any part of the Californian seacoast, because it is particularly accessible from Los Angeles by railroad, and has become the leading watering-place between Coronado and Monterey. A long sweep of seashore, bold, high cliffs, with an almost level plain above them, rising north and north-east to the bluest of mountain ranges, and traversed by deep barrancas or straight-sided cañons, such is the general aspect of the great Santa Monica rancho. Fifty years ago a hundred thousand acres here, the estate of an old Spanish family, supported vast herds of horses and cattle. Then came the railroads—the American town-builders. Senator Jones, of Nevada, and others bought the ranch, founded the town, pushed out an immense wharf a couple of miles away, at Port Los Angeles, where the steamships land, and Santa Monica, upon the frostless bluff overlooking the blue Pacific, began to take shape. Now one sees there rows of tall Bananas, heavy-fruited, all winter long; Tacsonias and Passifloras grow and bloom, and semi-tropical gardens surround costly cottages on every hand.

The greatest and deepest barranca in this entire Santa Monica plain is that known as the Santa Monica Cañon. It is not really a cañon in the strict interpretation of the Spanish word, which refers to mountain ravines, but more nearly conforms to the Spanish idea of a barranca, a wide cleft across the plain from the mountains to the sea. In reality there are two large barrancas there, running in a direction somewhat parallel for four or five miles, although they are sometimes close together, and at other times wide apart. The narrow tongue of land between them extends to within an eighth of a mile of the ocean. The two streams of water that flow through these deep and well-wooded depressions unite at the foot of this gradually sloping tongue of land that overlooks the seabeaches. Here, on the sides and summit of this narrow central plateau, between two deep gorges, the Santa Monica Forestry Station is situated. It is almost completely hidden from the town and the watering-place. It is greatly sheltered from storms, and yet the view from its heights is wonderfully extensive.

To the tourist driving northward from Santa Monica, along the cliff overlooking the Pacific, the dry level plain seems to stretch unbroken, except by slight depressions, for twenty miles. Suddenly, by an old adobe ruin, he pauses, at the verge of a cliff; a hundred and fifty feet below, the Santa Monica ripples over its pebbles and through its groves of giant Sycamores, which rank among the noblest in southern California. Half a mile beyond, the plain continues again on the same level; between the two divided fragments a narrow tongue of rocky land projects and sweeps in long curves downward to the Sycamore groves. Eastward, along the ascending lines of the vast chasm, are darker and larger masses of forest, Walnut, Oaks, Cottonwood and other groves of Sycamores. Beyond, and at points of vantage on the sides of the descent, are plantations and avenues of various species of Eucalyptus. The cultivated fields cease at the edge of the gorge, and only begin again beyond the further cliff; the space be-

tween, painfully cleared in spots, and planted with grass and corn, is for the most part wild land thickly overgrown with lesser forms of vegetation, except where richer soil or the nearness of water has enabled native trees to gain a foothold.

The twenty acres belonging to the forestry station, a little arboretum tract, with hardly any waste upon it, extend from the bottom of the northern Santa Monica cañon, up slopes and across levels to the very top of the mesa, on the same plane as the town itself, and look down from thence to the bottom of the south cañon. Three distinct levels and two half-levels, with their connecting slopes, not too abrupt for planting—such is the charming topography of the station lands. Given five acres more of rough, stony western frontage sloping to the sea, and ten acres toward the east to carry the boundaries to natural lines, and the forestry station need ask nothing else in the way of land endowment.

The soil is rich and varied, suitable for good tree-growth and easy to till. Frosts, noticeable on the lower part of the tract, lessen as one ascends. Climatic observations are being kept on each of the three principal levels of the station.

According to the reports of the late State Forestry Board, the Santa Monica Station was founded December 20th, 1887. At that time Mr. Abbot Kinney was chairman of the Forestry Board, and I think it probable that he was mainly instrumental in the choice of the beautiful tract now occupied by the station. A fine collection of some forty species of Eucalyptus and Acacia was planted near the foreman's cottage, and these are now beginning to make a fine show. This collection, and also many choice single trees and some avenue work, were done during Commission days. The University has added to the collection, has cleared a good deal of brush-land, has greatly developed the water-supply, and is establishing a choice nursery of rare trees. All this takes time, and it may be several years before the scientific results of observations upon tree-growth here afford much data for publication.

Mere lists of species planted are seldom valuable. The phenomenal range of soil and climate offered to the forester here can best be shown by a few memoranda :

On the lowest and coldest level, three or four feet above the creek-bed, are Camphor-trees, several Hakeas, a Banana, Dracenas, an immense mass of the Hawaiian Taro, *Caladium esculentum*, growing in the moist soil that receives the overflow from a hydraulic ram used to lift water to the dwelling-house, a hundred feet higher. Tender species of Eucalyptus and other trees are grown in seed-beds here. The soil is a light sandy loam, mixed with leaf-mold from the Willows, Cottonwoods and Sycamores that shelter and half surround the place.

The bluff between the lowest level and the main or cottage plateau is heavily wooded except where nearly perpendicular. It is moist, with springs and green with vines and beautiful undergrowth. Here Azaleas, Rhododendrons, Camellias, Kalmias, Magnolias, Clematis and similar species are being planted by the roadside or in the small clearings in the rich loam at the base of the bluff. Broom and Gorse are being naturalized higher up the bank. One more sunny place, a hollow of rich, black peaty soil, has been occupied by a score of Fig-trees of different varieties and by clumps of Bamboos. Olives, too, have been planted—fifty trees in eleven varieties. It serves to illustrate the range of possibilities here, that on a wind-exposed point, not a hundred feet from where the Figs and Olives are thriving, a mass of close-set *Pinus Austriaca* has proved itself at home.

The middle plateau, where the Eucalypti and Acacias are chiefly planted, also contains the beginnings of a Palm collection, a *Jacaranda mimosifolia* (one of the Rosewood-trees), and a large number of tender trees and shrubs. The soil is a loose, rocky loam, warm, light, and needing no irrigation for trees set early in the season. The growth of *Quercus Cerris* and *Q. Robur* have been most satisfac-

tory. The scarlet Hibiscus and the scarlet Passiflora, *P. incarnata*, have not shown a sign of injury in winter. The native growths are *Quercus agrifolia*, *Rhamnus Purshiana*, *Juglans Californica*, and large Elders, some of them thirty-five feet high, with trunks eighteen inches in diameter.

The second steep bluff, another hundred feet high, that lies between the middle plateau and the mesa, contains enough soil for trees and shrubs, and is being cleared preparatory to planting. This portion, as well as the top, requires great care to secure a tree-covering. It may be considered as fairly representative of an immense area of mesa-lands in California. The native growth is *Rhus laurina*, *Rhamnus Purshiana*, the so-called wild Coffeeberry of California, with *Paeonia Brownii*, *Salvia spathacea*, and the inevitable host of *Compositae*. In spring-time the mesa is very beautiful.

Several rows of large *Eucalypti* border this upland; the middle portion of seven or eight acres is unplanted, except for some Ashes and Olives, which have done very well, and here, rather than on the lower plateaus, the first scientific effort at establishing a mixed high forest will probably be undertaken as soon as the soil is in good condition and the trees ready. The Cork Oak, *Quercus Suber*, has done so well in southern California, surpassing in rapidity of growth any other Oak, and Oaks are so well indicated by the native growth of the plateau that a grove of Cork Oaks will probably be placed there. But the more valuable species of *Eucalyptus* and *Acacia* seem to be more nearly adapted to the mesa.

The chief value of a forestry station on so small a tract must be on its arboretum side, and, fortunately, this station is so near Santa Monica and Los Angeles that a summer school of forestry, with popular lectures, would be well attended. Its importance as an educational centre in years to come cannot easily be estimated. If the National Government creates an adequate forestry system for maintaining and managing the present reservations in California and elsewhere, a place like the Santa Monica Station might in time offer many advantages for a school of forest-science.

Niles, Calif.

Charles Howard Shinn.

New or Little-known Plants.

New Cypripediums.

CYPRIPELUM SALLIERI PICTUM.—This is a cross between a fine variety of *Cypripedium insigne* as the seed parent and *C. villosum albo-marginatum* as the pollen parent. The dorsal sepal is large and slightly reflexed at the base; the lower half is greenish yellow, heavily marked and lined with purplish brown, which on entering the pure white upper half becomes rich violet. The petals and pouch much resemble those of *C. villosum*. Only two plants of this fine variety are known in cultivation, one of them having its home in the well-known collection of Hicks Arnold, Esq., of New York.

CYPRIPELUM NITENS PITCHERÆ.—This variety of *Cypripedium nitens* is the result of a cross between *C. villosum* as the seed parent and a very fine variety of *C. insigne* as the pollen parent. The dorsal sepal is very large and broad, with a deep white margin. The centre part is light green, heavily marked with large spots of dark brown, some of them measuring from three-eighths to half an inch in length, and extending into the white margin, where they become violet in color. The petals and pouch resemble those of *C. villosum*, but are much finer in form and deeper in color. The crossing was done December 24th, 1891; the seed was sown June 19th, 1892, and the plant flowered January 23d, 1895.

CYPRIPELUM CALYPSO ROTHWELLIANUM.—This is a noteworthy hybrid, having for its parents *Cypripedium Boxallii superbum* as the seed parent and *C. Spicarianum roseum* as the pollen parent. The leaves are broad, about seven to nine inches in length, of a dark green color. The dorsal sepal has

a very heavy midvein of deep purple from base to apex, and the whole sepal is densely suffused with the same color, with the exception of a narrow white margin. The petals are slightly undulated, of a brownish purple color, with a heavy midvein of dark purple. The pouch is the same color as the petals, and the staminode is pale lilac, with a green spur in the centre. The plant was raised by Pitcher & Manda, at Short Hills, New Jersey, and named in honor of J. E. Rothwell, Esq., of Brookline, Massachusetts. The seed was sown January, 1892, and the plant first flowered in January, 1895.

CYPRIPEDIUM JANUS.—This is a distinct and beautiful hybrid between *Cypripedium villosum superbum* as the seed parent and *C. Leeannum Masereelianum* as the pollen parent. The leaves resemble those of *C. Leeannum*, only they are more erect in habit; they are from six to eight inches long and one and a half inches broad. The dorsal sepal is large and flat, with a broad white margin prolonged to the base; the centre part is delicate green, nerved with a darker shade of the same color, and heavily marked and spotted with blackish brown. The inferior sepal is pale green, veined with darker green. The petals are broad, with a heavy purplish brown midvein, the upper half brownish purple on a green background spotted with purple; the lower half is lighter in color and more densely spotted. The pouch is shiny, yellowish green, tinted with purple, veined and lined with dark green. The staminode is purplish green, having a bright green spur in the centre. The parent flower was fertilized October 23d, 1891; the seed was sown March 18th, 1892, and the plant flowered January 24th, 1895.

Plant Notes.

SEMELE (RUSCUS) ANDROGYNA.—This plant is a native of the Canary Islands, and, although long in cultivation, is rare with us. There are a few plants in the neighborhood of Boston, which were undoubtedly brought from Fayal, where it is, of course, hardy, and is frequently planted. It is a greenhouse evergreen climbing shrub, closely related to *Asparagus*, and might be described as a huge *Smilax*, namely, *Myrsiphyllum*, entirely lacking the grace of its relative, but more than making amends for this deficiency by its bold and vigorous growth. At this season of the year, or a little earlier, stout stalks, resembling a large and much elongated *Asparagus* head, are thrown up, and, under favorable conditions, attain lengths of twenty feet or more; from these spring numerous branches which look like great pinnate leaves. The true leaves, however, are almost unnoticeable scales at the base of these apparent leaves or cladodes. Early in February the small white flowers are produced in large numbers on the margins of these false leaves, giving the plant a very singular, almost unique, appearance. The flowers are succeeded by round pulpy berries, not common with us. This *Semele* should be planted out in a well-prepared border of rich soil, in a cool greenhouse, and trained over a back wall or on the rafters; it is too rampant a grower to succeed in pots or tubs, unless they are very capacious. A well-established plant will furnish quantities of foliage admirably adapted to household decoration, particularly where bold effects are desired. The propagation is by seeds, which sometimes require two seasons for germination, and are not always easily obtainable, or by division, which is a slow and unsatisfactory method; these difficulties probably account for the scarcity of the plant in cultivation.

DANAË (RUSCUS) RACEMOSA.—This plant is not unlike *Semele*; indeed, they have both been known by the common name of Alexandrian Laurel, but the *Danaë* is less exuberant in its habits of growth. It has branching stems, and its general effect is more graceful, reminding one of some of the Bamboos. It grows three feet or more in height, and makes a good pot-plant; it can also be satisfactorily grown in a greenhouse border. The cladodes are lanceolate, an inch and a half or two inches long, of good vivid green, and well fitted for any decorative use which

requires lasting foliage. The flowers are small, borne on the end of the branches, and are followed by bright red berries, which are occasionally produced here in limited quantities. The propagation is the same as in *Semele*. A recent article in *Revue Horticole*, No. 23, 1894, p. 545, gives a description of these two plants, and also of several species of *Ruscus*; none of the *Ruscus*, however, are desirable for ornamental purposes; they are simply curious and of botanical interest only.

CENTROPOGON LUCYANUS.—Mr. Cameron writes that this beautiful plant has been for some time flowering in a moderately warm greenhouse at the Harvard Botanical Garden. It was raised about thirty-nine years ago by Monsieur Desponds, of Marseilles, being a hybrid between *Centropogon fastuosus*, another good plant, and the Brazilian *Sipho campylos betulæfolius*. The plant has a half-procumbent habit, and the stems are clothed with oblong, lanceolate leaves. The tubular, rosy carmine flowers are borne at the ends of the branches. As a winter-flowering plant for the warm greenhouse this *Centropogon* has much to commend it. Its blossoms are not only showy, but a succession is kept up for a long time. The plants can be raised annually from cuttings taken in the spring. If the cuttings are placed in sand with a good bottom-heat they hardly ever fail to root. When rooted they should be put into small pots of light rich soil and shifted on as required during the summer. In spring the young plants need a rather warm greenhouse, but in summer a cool, moist, shady house or frame suits them well. Perhaps, in no better way are the flowers of this plant shown to advantage than when the plants are grown in baskets suspended from the roof. The drooping habit of the plant suits it admirably for this treatment.

GYNURA AURANTIACA.—This composite plant was introduced from Java about fifteen years ago. In a warm greenhouse this is its flowering season, but the plant is not grown so much for its flowers as for its beautiful foliage. It grows from two to three feet high, and its stems are well clothed with leaves from four to six inches long and three to four across, and these are furnished over their entire surface with small hairs of a beautiful violet color. The small flower-heads are produced in corymbs and are of a brilliant orange color. It is propagated by cuttings, which root easily, and the plant enjoys a light open soil and a warm greenhouse. With its beautiful stem and leaves it makes a plant which is useful whenever handsome foliage is wanted.

THUNBERGIA ERECTA.—This west African plant is, perhaps, better known in gardens as *Meyenia*. It is almost a constant bloomer, but flowers most profusely during the winter months, and at this time it is one of our prettiest of dwarf stove-shrubs. It is a much-branched plant, and when not pruned too hard has a graceful habit. The small, dark green, ovate leaves are set thickly on the branches, and even when the plants are not in flower they make handsome small bushes. The dark blue flowers are produced singly in the axils of the leaves, and are about one inch and a half long and about the same across. Young plants are obtained from cuttings of the young wood, which root easily at any time. The variety with white flowers is also in bloom now, and makes a good companion plant to the blue-flowered one. This *Thunbergia* and its variety thrives in a stove, where it will get a strong moist heat, and in a rich open compost.

Cultural Department.

Vegetables under Glass.

FORCING BEANS.—No beans are better for forcing than the group known in European gardens as French, or Dwarf Kidney Beans. In this country we call them String Beans, but the term is very vague, and applies, apparently, to all beans whose pods are used for kitchen purposes. Several varieties of the Bush Lima and French sections have been in active growth here for some weeks past. Two varieties of the Bush

Lima, Henderson's and Burpee's, were sown in the same bench on January 2d. Under summer outdoor cultivation the Bush Limas are bushy in growth and seldom more than eighteen inches or two feet high. In the greenhouse, however, Burpee's Lima has become a true runner, and with few lateral shoots the main stems are already six feet in height, and are now developing a few flower-clusters toward the top. Plants

benches, and for some reasons pot-culture is to be preferred. The plants in pots were sown December 5th, and we have been picking marketable pods from them since January 25th. The bench plants are just coming into bloom, and even with the increase of light and sunshine three weeks will probably elapse before they will be ready to pick. In the matter of earliness the plants in pots clearly have the advantage. The



Fig. 9.—A Red Cedar in Eastern Pennsylvania.—See page 61.

of Henderson's, on the other hand, although sown at the same time, are only twelve inches high, and are showing some inclination to run, with no indication of flowers or branches. I am unable to account for this difference in these two varieties, and their change in habit of growth is likewise puzzling.

With the French, or Dwarf Kidney Beans, we have been more successful. These have been grown in pots and on

pots are convenient since they can be used to fill small vacant spaces which occur in most greenhouses from time to time, such as otherwise might go to loss. We use any ordinary potting soil that may be handy, loam largely predominating, and seven-inch or eight-inch pots, and sow about a dozen seeds in each pot. Later on the plants may be thinned out to half that number; but, as seedling Beans in greenhouses are

subject to damping-off fungi, it is advisable to sow a few extra seeds in each pot. A high temperature, not lower than sixty-five at night, is the best, and where the plants are grown for more than one gathering of the fruits, they should be watered occasionally with weak liquid-manure after the first picking has been made.

In cultivating Beans on benches we sow the seeds in lines about eighteen inches apart, afterward thinning out the plants to two or three inches apart in the rows. The damping-off fungi and red spider are the most destructive enemies of these plants under glass. Moist soil and atmosphere encourage the growth of the fungi, and the same conditions keep the red spider in check. We have found, however, that sulphur or powdered charcoal, scattered among the plants, will retard the injurious effects of the fungi, and a diluted kerosene emulsion, applied frequently, destroys the red spider.

We have grown three varieties of these French Beans—Emperor William, Early Warwick and Syon House. Early Warwick is a very good sort, producing a good crop, somewhat in advance of the others. The growth of Emperor William is weakly, and the crop poor; but Syon House is, by far, the best of all for general purposes; it is strong and healthy, and produces a large crop of excellent pods.

TOMATO IGNOTUM.—This excellent variety is an admirable copper out-of-doors, and is, perhaps, the best Tomato for forcing. The fruits are of good size, smooth and handsome in appearance and of excellent flavor. Large tomatoes are liable to crack, and whatever other good qualities a tomato may have it is comparatively worthless if it cracks. The Ignotum never cracks, and yet the skin is neither so thick nor so tough as is that of many tomatoes that do crack. We have one house almost exclusively devoted to this Tomato, and the crop has been uniformly excellent. The plants are mostly grown to a single stem, and one such plant has already produced two pounds of first-class fruit, with good promise of three pounds additional. It may be added that a single fruit on this plant weighed eight and a half ounces. The Ignotum was a chance seedling from a small German variety found on the grounds of the Michigan Agricultural College by Professor L. H. Bailey some five or six years ago. It has been offered by the seedsmen each year since 1890.

M. Barker.

Cornell University.

Violets.

If there was as much certainty of success with Neapolitan Violets as with many other florists' flowers, they would be abundant and cheap, but the difficulties attending their cultivation will always make them highly prized flowers. They simply need a good soil, with some proportion of lime in its composition, and sunshine and all the air possible during winter-time. A comparatively low night temperature of thirty-five to forty degrees, Fahrenheit, will give a long season of bloom with large flowers, though not many at a time. With a temperature of forty-five to fifty degrees the flowering season will be shorter, with an enormous crop during January and February. If we may consider the normal temperature of these plants to range from forty degrees down to almost freezing-point, it follows that they are forced to a certain extent whenever they are grown in a temperature above forty degrees. Violets in frames are frequently subjected to a few degrees of frost, and when kept screened from the sun's rays until they are thawed out the plants do not suffer. Some of our best growers use frames altogether, and, except for the misfortune of disease, have been generally successful, especially with Marie Louise.

Damping in frames has always been a source of trouble. This is a kind of black mildew, which quickly spreads if the plants are not carefully looked over every day or two. The largest and healthiest plants are almost always the first to be attacked. It is difficult in winter, especially with frames, to air sufficiently, and the disease spreads quickly if the frames are closed for a day or two, as often happens during a period of bad weather. A dry atmosphere seems essential. Some growers use a mulching of dry horse-litter, well rotted, composed mostly of droppings. This, it is claimed, takes up the surplus moisture given off during the night and when the frames are closed, liberating the moisture when the frames are opened. No doubt, this would act beneficially in reducing the danger of damping, if air could be given every day. Other growers use dry sand with the same object. If it does no more, it makes a clean cover for the ground and keeps the flowers from soiling. This practice we follow here, and I have noticed that the sand is moist in the morning, and quickly becomes dry during the day when air is given. When the Violets have been poor I have tried everything that promised

to be of benefit to them; among other things, powdered charcoal and sulphur. I still think this was effectual against disease, but objectionable on account of the odor.

The Marie Louise is the most popular of all the Neapolitan Violets. It is, however, the most difficult one to grow, and Lady Hume Campbell is now very largely grown in its stead. The color of the latter is blue rather than violet, and mauve would be, perhaps, the most correct designation. The popularity of the violet shade seems to be all a matter of taste, and unexplainable in any other way. The tone of the Lady Hume Campbell is decided enough.

A gardening acquaintance of mine is having wonderful success with Marie Louise grown in pots in the greenhouse in a night temperature of about fifty degrees, but for one grower who succeeds on this line a dozen fail. To chronicle the various methods of different cultivators who have succeeded would take up much space. Some grow in pots, others in frames; some in light soil, and others in heavy; some in shade, and others in sunshine; some in a greenhouse with Carnations, at a night temperature of fifty degrees, and others in a temperature very little above freezing. The successful plan of one year too often fails the next. I have tried about every way I could think of. I have potted rooted runners from the bed in February, thoroughly hardened them off, and planted them in May in specially prepared soil, with lime and soot worked in. The result was a splendid growth until August, when the spot attacked them. The sight, and smell for that matter, of these diseased plants was so distressing that I have taken another path rather than pass by them. I started the next season with fresh stock which never had been diseased. I was informed that a successful grower divided his plants, so I tried this plan, but succeeded no better; I think dividing the old stools the worst plan of any, for if any disease lurks on the foliage or the roots it is apt to be perpetuated in this way. This is especially the case with the nematodes, sometimes called club-root. It is said to be the work of a small worm, which makes a gall on the root about the size of a grain of mustard-seed. The work of the nematodes is so insidious in its character that plants will thrive, appearing healthy and even vigorous. But the plants, when taken up in the autumn and put into frames, scarcely ever bloom, and gradually dwindle away. Curling, scorching leaves are a sure indication that the pest is at work. According to those who have made a special study of this pest, some of its species are common in most gardens, especially such as have been under cultivation a long time. I find it on Begonias, Salvias, Asters, Heliotrope, Abutilons, Roses, Lettuce, Cucumbers, Melons and Tomatoes, and I have also found it on many weeds. It appears that to avoid this disease we should select a piece of new ground. Information as to how to prepare ground so that it would be free from germs would be valuable. Rotation of crops might work to this end, if we only knew which are pest-proof. In preparing soil for Violets last season I adopted the plan followed by Mr. Montgomery, of the Waban Rose Conservatories, of heating the compost with fermenting materials, bone-meal being the principal agent. The temperature thus attained is such that all insect life is destroyed.

When I imported Lady Hume Campbell, four years ago, it was so badly infested with nematodes that I had some difficulty in saving it. The flowers were poor in size and color, compared with those now in bloom. Gradually, however, by taking cuttings instead of runners, as I had formerly done, I brought them into a healthy condition. This season they are very fine, and average 1,000 blooms a week on 208 plants, last week giving 1,200 flowers.

Last June I thoroughly cleared the bench and lime-washed it, and being sure that the compost was free and the stock healthy, I planted on the 10th of that month. The sashes are removable, and the plants remained exposed to the full sun during the whole summer. I gave them an abundance of water when well established, but no stimulants. They made splendid growth, and never showed any trace of disease. Some stock which was left over from the year before was planted with a doubtful lot of Marie Louise in the vegetable garden, and showed disease. As a preventive I used two gallons of prepared Bordeaux mixture during the most dangerous months, August and September. Whether I owe anything to its use I do not know, but this I can say, that on the diseased plants in the garden those sprayed were as badly diseased at the end of the season as some few plants which were left unsprayed, for experiment. My conclusions on the application of copper compounds are that they may be excellent preventives, but of no use where the disease has got headway. It ought to be generally understood that it is not claimed that the copper compounds are curative, but only preventive—that is, they will not kill the fungus which is at

work within the plants, but when healthy plants are covered over with a thin coating of the mixture the spores of the fungi will not germinate and infect the plants.

The Messrs. Farquhar, of Boston, state that their new Violet is a sport from the Lady Hume Campbell. If so, it is an acquisition. I have examined it, and, so far as I have seen, it is healthy. The flowers are much larger than those of the Marie Louise, and of identically the same shade.

Wellesley, Mass.

T. D. H.

Chrysanthemums.

THE propagation of Chrysanthemums must begin at once if good strong plants are desired. The first essential is the selection of good cuttings, and this does not mean large soft shoots, which are harder to strike, and after they are struck throw up a soft weak growth, from which good blooms cannot be obtained. A firm, short-jointed cutting, although smaller at first, will in every case make the best plant in the end. Another mistake is to strike the cuttings in too much heat, and in this way a great proportion of Chrysanthemums are ruined at the very outset. A temperature of forty to forty-five degrees at night is quite high enough. The cuttings may be struck in a propagating-bed in sand, in boxes, or singly in pots, in a light sandy mixture. The pot method, where space can be spared, is, no doubt, the best, as the plants receive less check in shifting, and this should be avoided in the first and in the successive shifts. The main point in Chrysanthemum-culture is to keep the plants growing continuously, and they should never be allowed to be checked through any cause; they should have free exposure to light and air and the general conditions which will induce free, but firm, growth.

Tarrytown, N. Y.

William Scott.

Winter-flowering Begonias.—Young plants of these Begonias, from spring-struck cuttings, have with us proved better than old plants, as they flower more freely and throw better blooms. The cuttings are struck in February, and kept growing freely under glass until August, when they are removed to a cold frame. The pots are plunged in ashes or leaves and gradually exposed to air and sunshine. Finally they should be left uncovered by night and day, so as thoroughly to ripen the wood. They should be moved inside before danger of frost. They bloom profusely all winter through in a light airy house with a temperature of fifty-five degrees at night, allowing a rise of fifteen degrees by sun-heat.

Tarrytown, N. Y.

William Scott.

Correspondence.

The Saghalin Knot-weed.

To the Editor of GARDEN AND FOREST :

Sir,—Wide publicity has evidently been given to the short note I published in GARDEN AND FOREST of October 11th, 1893, on *Polygonum Sachalinense*. These observations were simply as to its remarkable growth for a period of twelve years here at the college under all conditions. It spreads so freely by its underground stems that it may be an extremely pernicious weed, as some other members of the genus *Polygonum* are in the west, notably *P. Muhlenbergii*. Land set aside for "Sacaline" may have to be given up forever to it, just as in the case of Johnson Grass in the south.

As to its feeding qualities there may be question; as yet no one in this country has tested it, and I understand there are some unfavorable reports from Europe. Corn will still continue to be the best forage-plant in the Mississippi valley. I do not believe that any plant, whether used for ornamental purposes or in horticulture or agriculture, should be recommended for general or extensive use until it is sufficiently tried under all conditions, climate and adaptability to soil.

Agricultural College, Ames, Iowa.

L. H. Pammel.

[We observe that GARDEN AND FOREST has been referred to in several circulars as having advocated the use of this Knot-weed as a forage-plant. Two years ago, when the eminent French horticulturist, Monsieur Charles Baltet, reported the enormous growth of this plant, our London correspondent referred to it as a matter of news, and we afterward stated that a near relative of this *Polygonum*, *P. cuspidatum*, a plant which had also been commended for its economic value by some European authorities, had proved an aggressive weed in Central Park. However, we suggested that it would be worth while to try these *Polygonums* where no other forage-plant will grow,

although it was added that we did not think it probable that they would ever supersede Indian Corn in the Corn belt of this country. It is wise to test any plant which comes well recommended, but we agree with Professor Pammel that it is not safe to be confident about the value of any novelty until it has been thoroughly tested.—ED.]

New Orchid Baskets and Plant Tubs.

To the Editor of GARDEN AND FOREST :

Sir,—When visiting the greenhouses of Mr. Adolph Schoeninger, of Chicago, some time ago, I was impressed with the neat appearance of his collection of Orchids. There were no unsightly baskets or ugly pieces of half-rotten or charred wood, which too often annoy the eye in such places. Most of these Orchids are grown in neat baskets suspended from the roof or on benches, in cylinders and on flats of different sizes and design. Not being satisfied with the square baskets so commonly in use, Mr. Schoeninger constructed for his collection different styles of baskets and rafts, using at first cedar, pitch-pine, maple, cherry and other woods, but at last decided upon the wood of the southern Cypress, which is almost as durable as red cedar and much cheaper. For such plants as are usually grown on pieces of wood or cork, rafts were constructed, made of octagonal strips of cypress wood, pierced with holes through which runs a copper or galvanized wire. The strips are kept apart by turned buttons of the same wood. The Orchids on these rafts are growing in sphagnum moss and Fern-roots, and are fastened to the bars of the rafts by wire. Epidendrums, several Dendrobiums, Stag-horn Ferns and a number of Bromeliads are grown on these flats. Through the pliability of the wire the sides of the rafts can be turned up so that they assume a boat-like form. Filled with crocks, charcoal, peat, Fern-roots and sphagnum moss, they serve, in this way, the same purpose as the common baskets. In these boat-shaped appliances many Orchids, Tillandsias, Pitcairneas, Billbergias, Caraguatas, several species of *Æschynanthus* and Peperomia can be grown successfully in a warm, moist house. Larger flats can be turned into cylinders, and in this way they are excellent receptacles for Vandas, *Ærides*, Angræcums, etc.

Most of the Cattleyas, the large-growing Dendrobiums and many Lælias, however, are grown in 'pot-like' baskets, which are also constructed of cypress wood in sizes from four to twelve inches across. The roots find an excellent hold on the numerous bars on whch they run up and down in tangled masses. Besides their neat appearance, the peculiar shape of these baskets induces the plants to root freely, giving them an advantage over the baskets in which Orchids are generally grown. Another advantage of these baskets is that they can stand on the benches like flower-pots, or they may be suspended from the roof like other baskets. They have movable bottoms, which are firm when in position.

Mr. Schoeninger, who is an enthusiastic amateur gardener, spends much of his leisure time in his greenhouses, trying to grow his plants into healthy specimens. Being dissatisfied with the clumsy appearance of the common tubs where Palms and other large-growing plants are usually grown, Mr. Schoeninger invented a new, neat and simple flower tub, which has also the advantage of being very durable. Instead of the common hoop, a strong copper or galvanized wired is used, which runs in a groove around the staves. The ends of the wire are fastened neatly under the handle by the turning of a nut. The handle is so constructed that the small tub can be lifted by hand; in case of larger ones, sticks can be placed under the handle, thereby allowing any weight to be lifted with ease. Cast-iron feet are attached to keep the tub from the floor, allowing also a free circulation of the air and a good drainage. There is a neatness about these tubs and baskets not found in any other I am acquainted with. They are also exceedingly cheap.

Milwaukee, Wis.

H. Nehrling.

Meetings of Societies.

Nebraska State Horticultural Society.—III.

OUR report of the successful annual meeting of this society concludes with abstracts of two papers on Grape Growing:

THE MANAGEMENT OF VINEYARDS.

A paper by Professor F. W. Card on this subject began with suggestions on the selection of a site, which he said was more important than that of soil. Any open or well-drained soil will

answer, but the familiar phrase, "vine-clad hills," indicates that high lands have been recognized always as the natural home of the vine. This is because such situations are warm and dry, and in our climate they are less subject to late spring frosts, owing to the fact that they have what may be called good atmospheric drainage. Cold air settles into the lowest places, and the high knoll may often be above a cold stratum of frosty air in the valley below.

Analysis of the grape made in California shows that a crop of three tons of grapes to the acre takes from the soil thirty pounds of potash, a little more than nine pounds of phosphoric acid and a little more than ten pounds of nitrogen. This shows that about three times as much potash is used as either of the other ingredients. The ingredients of stable-manure are out of proportion to the needs of the grape, and it should generally be supplemented with potash of some kind. Stable-manure should be used with caution on thin land, and applied late in the fall or early in the winter, so that it will be available for early spring use. When applied in the spring there is danger that it will induce a late autumn growth and render the vine liable to injury in winter. An essential preliminary in the preparation of the ground is deep and thorough cultivation, and it seems to be the experience in most grape-growing regions that deep planting is better than shallow planting. Ten inches is generally recommended as the proper depth for planting throughout the grape-growing regions of western New York, and some growers advise as deep as twenty inches even in heavy soils.

In most cases the question of fertilizing the blossom is not an important consideration in planting, but such varieties as Brighton and Rogers' Hybrids must be planted near other sorts which will pollenate them. Some growers advocate that future efforts in the production of new varieties should be in the line of separating the sexes, as has been done in many of the Strawberries. It is said that the production of two crops, one of pollen and another of fruit, is too severe a tax on the energies of the vines. Besides this, pollen grown from male plants is said to be larger in grain and more potent than those from perfect flowers. Whether this division of labor should be encouraged may be questioned, but the character of the individual varieties in this respect is worthy of attention always, and especially in estimating the merits of a new sort.

After the vines begin to bear, of course, cultivation should never be neglected, especially in dry seasons. It is an advantage to have the soil covered with some growing crop in winter if this can practicably be done. The best crop for this purpose is one which will start late—not earlier than the middle of August—and make a rapid growth before cold weather, so that it will form a good covering for the winter. Wherever the winters are sufficiently mild, Crimson Clover seems to give the best satisfaction for this purpose, and in the west and north-west, perhaps, the common Field Pea approaches nearer the requirements than any other plant. Crops which can be put into the vineyard early in the season would rob the soil of much of the moisture which needs to be so carefully husbanded for the grapes, but if the vineyard has been thoroughly tilled during the early part of the year the injury from the late crop will be slight, and by the time the green crop will make any serious draft on the moisture of the soil the fruit is off and the vine should have ripened its wood for the winter. Professor Card's address concludes with an elaborate description of the various methods of pruning and training.

THE RELATION OF CLIMATE TO GRAPE-GROWING.

An interesting paper on this subject was presented by Professor G. D. Swezey. Last year he was able to trace a close relation between the amount of rainfall during the growing season and the yield of the apple-crop. He was not able to trace such a relation between the rainfall and the grape-crop, however. Indeed, a wet May is unfavorable to the grape-crop, by giving better conditions for the growth and propagation of fungi. Severe winters have, in some cases, caused the destruction of the crop even when the vines have been laid down and covered. Spring frosts, however, are the worst climatic enemy of the Grape. The conditions favoring a frost are the absence of wind and clouds and the continuance of a low temperature for some hours. Nearly all the temperature observations at the United States Weather Stations are taken on the top of buildings at a considerable distance from the ground. At the station at Lincoln the thermometers are seventy-five feet above ground. For a period of thirty days during the last of October and the first of November, comparisons were made between the temperature at this point and at the ground. Once during that time there was a difference of twelve degrees

between the minimum temperature on the roof and at the ground. A difference of six or more degrees was found on seven out of the thirty mornings. One of the chief effects of wind is in mixing the upper and lower layers of the atmosphere which prevents this excessive cooling of the lower layers. A moist atmosphere is one of the conditions which tend to prevent the occurrence of frost. The moister the atmosphere the higher the dew-point, and if the dew-point is above thirty-two degrees, so that dew begins to be deposited before frost comes, this is likely to prevent its occurrence altogether, for in the change from vapor to dew heat is constantly given off. This is one of the reasons why frosts are more common in the dry interior climates than in the moister eastern ones. The building of fires in the vicinity of the vineyard when frost is imminent is of value in two ways: by forming a cloud of smoke and thus preventing radiation, and by stirring up the atmosphere by the formation of upward currents of air.

Western New York Horticultural Society.—III.

THE following is a continuation of the proceedings of the late meeting of this society at Rochester:

NOTES ON ADULTERATIONS.

Dr. L. L. Van Slyke, of the Geneva Experiment Station, gave some instructive notes on the ways in which chemical adulterations affect the interests of fruit-growers. He spoke of the use of tin containing considerable quantities of lead, and thought influence should be brought to bear to have canners use only the better quality of tin, especially with the more acid fruits and vegetables, such as tomatoes, because of the danger of dissolving the lead. This also applied to the solder, as the more lead there was the more easily it melted, and hence solder containing much lead was often used. He drew attention to the higher color of French peas, due to coloring by copper. He also spoke of salicylic acid used for preserving fruits, which, though not a poison, is an irritant to the stomach. In unfermented wines alcohol is often added to preserve them, and vinegar is diluted with sulphuric acid and water. In the case of jams and jellies a cheaper material is often mixed with a more expensive one, and the whole sold under the name of the more expensive. For jams refuse material is often used, and many fruit jellies are made without any fruit, even for the flavoring. Among many samples examined, one of quince jelly was composed largely of beet-sugar and glucose, with flavoring composed of acids. Of thirty-two jellies and jams examined, twenty-nine were adulterated. A large number of the fruit essences are adulterated, especially pineapple.

In discussing the relative delicacy of tests for copper in solutions, Dr. Van Slyke said that the first test was that given by an excess of ammonia in a solution containing copper, thus producing a blue color. It will show one part in 25,000 parts of water. Potassium iodide gives a yellow tinge to a solution containing one part copper to 50,000 parts of water. Potassium ferrocyanide, as used in making Bordeaux mixture, detects one part in 400,000 parts of water. Potassium zanothate (a chemical seldom found outside the laboratory), added to a copper solution, will give a dense yellow color that will show in a solution of one part copper to 800,000 parts of water.

The most delicate test of all is that made by immersing any ordinary needle, wrapped with platinum wire, in a solution containing copper. An electric current will be set up and the copper will be deposited on the wire. The ferrocyanide test is so delicate that if it is properly used in making Bordeaux mixture there will be no copper left to hurt the foliage. The ferrocyanide should not be poured into the mixture until after the lime has been thoroughly stirred in.

An investigation was made concerning the relative quantities of potash and phosphoric acid required by fruit-trees, fruit and nursery-trees. As an average each tree used one and one-third pounds of potash for one pound of phosphoric acid. The fruit averaged four pounds of potash to one of phosphoric acid, while nursery stock required sixteen and a half pounds of phosphoric acid to thirty pounds of potash to the acre, the extremes of phosphoric acid being from ten to twenty pounds, and of potash seven to forty-eight. From the above it will be seen that the orchardist needs to use a larger proportion of potash than comes in ordinary commercial fertilizers. He had written to a large number of firms for prices on single fertilizing ingredients, and found most of them willing to sell these separately, though generally recommending their mixed goods. He advised buying dried blood in Chicago, as it was less liable to be adulterated than after it had been sent to New York, where large quantities of leather scraps mysteriously disappear presumably into dried blood.

A PRACTICAL VIEW OF SPRAYING.

Mr. Albert Wood, of Orleans County, said he had an orchard of twenty-five acres on a gravelly loam. The trees were too close at two rods apart. The shaded ground became mossy; the red apples showed little color. He went through the orchard and cut out every other tree six years ago, since which time he has cultivated and fed those that were left. In 1893 he sprayed two trees; on these the apples were good, while most of the others went to the dry house. On the 20th of April, 1894, he sprayed his orchard, except fourteen trees left for comparison, with twenty pounds of copper sulphate, four pails of lime and 150 gallons of water. He sprayed again as the buds were swelling, and again when the apples were half an inch in diameter. About this time the apples on unsprayed trees began to drop. With the last two sprayings he used Paris green—one pound to each 150 gallons of water. On the fourteen trees not treated the foliage was rusty. The thirty-five barrels of fruit he picked from them shrank five barrels between picking and selling. Of the 2,000 barrels of treated fruit the shrinkage was not five barrels in the same time, and they brought thirty-eight cents more a barrel. On a Strawberry Apple-tree that had not had a perfect apple in nine years every apple was sound. Similar results were had with King, Baldwin and Twenty-oneounce trees. Of Roxbury Russets three-fourths of the untreated apples were ground for cider, while most of those treated were good. Roxburys should have five sprayings a season.

Pears were treated in the same way as the Apples. Some Virgalieus had borne no perfect fruit for twenty-five years, and this year, when sprayed, there was no imperfect fruit. His results showed ninety per cent. gain by spraying. In a young orchard-row not treated the leaves fell three weeks earlier, and the foliage was not as heavy as on the sprayed trees. He had similar results with treated and untreated Cherry and Plum trees. From Fay's Currants which had been sprayed he picked fruit twenty days after others were gone. He thought the Bordeaux mixture should be applied as a mist, and that the Vermorel nozzle was best except for the higher trees, where the McGowan was the best. A tree should be sprayed till it drips. You cannot throw Bordeaux mixture far when reduced to a fog, and, therefore, for large trees long bamboo-poles must be used to hold the nozzle close to the foliage. He used 900 pounds of copper sulphate for thirty days' spraying.

PEACHES AND APRICOTS IN WESTERN NEW YORK.

Mr. Nelson C. Smith, of Geneva, said that these fruits could be successfully produced with proper study and care. It will not answer to trust to luck for fine fruit, and fancy fruit alone brings fancy prices. It is a greater drain on a tree to produce two bushels of second quality fruit than a bushel of extra-fine fruit. When the trees have done their work, it is necessary, if the highest price is secured, to pick the fruit at the critical moment when it is just ripe enough, but not too ripe, and then it must be packed in small, neat packages.

The soil best adapted to Peaches is a rich mellow loam with a clay subsoil, preferably high and rolling, near large bodies of water. Half of the previous season's growth should be shortened in every year and cut so as to make a fine-shaped head and kept well supplied with bearing shoots. At six or seven years old it will not need severe cutting.

The thinning is the most neglected of all the operations of Peach-growing. The fruit should be thinned to five or six inches apart. Some persons believe it costs too much to thin, but the fruit must be picked some time, and in this instance the early picking more than pays in the increased value of the later one, not to speak of the saving of strength to the trees.

Apricots are now known to be hardy on the eastern bank of Seneca Lake, and they are considered better than California fruit. The Early Golden has produced fifteen crops in twenty years. The so called Russian varieties are no more hardy than many others, and are poor in size and quality. Apricots need a dry soil and treatment similar to Peaches. The essentials for success are a good location and soil and persistence in fighting the curculio. It requires judicious marketing and pluck, if any fruit does. It demands severer thinning than any other fruit, for if the fruit is allowed to remain this will check the growth of the tree, and the fruit-buds are formed on the new wood. Myrobalan and Marianna stocks are best on heavy soils, and Apricot for light soils.

To a member who asked why his Duchess pears rotted in the ice-house in September, Mr. Barry replied that the trouble was usually caused by picking too early. He considers it best to leave Duchess, and even Anjou, on the trees until the

third week in October—that is, to leave them on as long as possible. When they are picked too early they shrivel. Mr. Bell thought it better to leave Duchess pears on the tree even till a frost touches them than to pick them before the second week in October. Light frost will not injure them. Mr. Morrell, of the Michigan State Horticultural Society, said that trees well fed with phosphoric acid and potash will hold pears two or three weeks longer than those not so fed, and the pears will grow wonderfully during that time.

In answer to a question as to how to build a cold-storage house, Mr. Lyons described some successful ones as having brick or stone walls for a part of their height, with a double-boarded frame of eight-inch studs above, the space between the boards being filled with sawdust, and the whole then ceiled inside and out. There are no air-spaces in the brick wall. The buildings are cooled by opening and closing the doors and windows in accordance with the outside temperature. Mr. Boag, of Batavia, spoke of his having two sixteen-inch walls of stone, with a two-inch air-space and double floors. There were ventilators at the bottom and in the roof. Two years ago he kept apples till May in good condition, while many had trouble with mildew.

Mr. Woodward had fruited the Crosby Peach two years. The trees were productive and ripened fruit a little earlier than the Smock and after Late Crawford. This peach has a small pit, fair flavor, and is not large, but fairly handsome. The tree is a poor grower. On the whole, he is well pleased. Another member stated that all the fruit-buds on Crosby trees were killed in his orchard, but this was also true of other varieties.

Recent Publications.

A Practical Flora for Schools and Colleges. By Oliver R. Willis, A. M., Ph. D., New York. American Book Company.

What Dr. Willis means by a practical flora is explained in the preface of this book to be one which "shows the practical aspects of the vegetable world and its relation to the needs of every-day life, for the purpose of engaging the interest and the enthusiasm of such pupils as do not have the scientific mind which makes the acquirement of the science an end in itself, nor the poetic temperament required for the love of the study for itself." In carrying out his design for arousing effort on the part of students whose mental endowment is somewhat restricted, Dr. Willis has added to the ordinary scientific description of plants generally found in school botanies some account of the economic features and the history of the different species. Since there are few plants which do not have some qualities which are useful, or hurtful, or ornamental, it is evident that the selection of these so-called practical notes should be very carefully made if the work is to have any proportion or symmetry, especially since the flora and its practical annex are contained within the limits of three hundred pages. In this selection we do not think that Dr. Willis has been altogether happy. Sometimes he goes into details which hardly seem attractive to the boy who does not love science for its own sake, as, for example, when he states that opium, the product of the Poppy, "is a very complex substance, containing a large number of bases in combination with sulphuric and meconic acids. Morphine, whose formula is $C_{17}H_{19}NO_3$, and narcotine, whose formula $C_{22}H_{33}NO_7$, are the most abundant and important," and to these he adds the formulas of codeine, thebaine, papaverine and narceine, which need not be repeated here. Excursions like this into the realms of organic chemistry might easily make a very large and repulsive work for pupils with no hunger for exact science, but at times these notes are much more popular as, for example, when he states that "no other small fruit is more generally cultivated than the currant, which is not only grown in the gardens of the rich, but is also to be found in the planted ground of the most humble cottager." The information that for "pies, puddings, dumplings and preserves the peach has no equal," does not err in being too profoundly scientific, nor do recipes for making apple butter or quince preserves. In other words, Dr. Willis's practical flora is encumbered

with much information which young pupils in botany cannot digest and assimilate, a great deal more that they do not need to be told, and very little which cannot be found in better form in the nearest cyclopedia.

Notes.

We have received a series of twenty pictures from different points of view of Mr. S. C. Nash's water-garden at Clifton, New Jersey, which has often been mentioned in this journal. These prints are from photographs taken by Mr. Nash, and they have been reproduced by the photogravure process, so that none of the delicacy of the photographic detail is sacrificed. The pictures not only give a good idea of such plants as the *Victoria regia*, the various *Nymphaeas* and *Nelumbiums*, but they convey instructive hints to any one interested in aquatic gardening, especially in the important matter of planting along shores, and thus furnishing a proper setting for lakes and ponds. Mr. Nash has a few extra sets of these views which he will dispose of at less than their original cost.

In *Meehan's Monthly* for February the sound advice is given to dig a trench before spring growth begins around large trees which are to be moved. The inside of the trench should be two feet from the butt or more, according to the size of the tree. It should be deep enough to cut off most of the roots, two feet at least, and the trench should be carefully filled up with good soil, which should be firmly packed about the ball. Next autumn many new roots will have been formed, and the transplanting of the tree will be much more easy and more certainly successful. When the trench is dug, the top of the tree should be pruned back, though not as severely as if the planting was to take place immediately. Mr. Meehan says that some large Scarlet Oaks and American Beeches treated in this way last winter made a very remarkable root-growth during the following summer.

The literature of spraying is becoming very extensive, and no one who wants to apply remedies against insects and fungi in this form need lack for information. Bulletin No. 74 of the Geneva Experiment Station gives a very complete account of the machinery for this purpose, but it is said that better machines are still needed. For Potatoes and Tomatoes a nozzle should be used which can be lowered between the rows and directed so as to spray up through the vines. The same sprayer should not be expected to do all kinds of work with equal satisfaction. The agitator, which keeps the mixture of uniform strength by preventing the heavier ingredients from settling, is one of the most important parts of any sprayer and one which works up and down like a churn dash is the best. Pumps for spraying should be made of brass, or should be brass-lined, and when the piston-head is packed the packing should be frequently changed.

A writer in a recent number of the *Gardeners' Magazine* gives an interesting account of the cultivation of Kent Cobnuts. The particular orchard, if such it can be called, which he describes, covers something like sixteen acres, and was carrying, at the time of the writer's visit, about thirty-two tons of nuts. Some of the trees on this farm are seventy-five years old, and in the rich deep soil of West Kent the stems of many of them are eighteen inches in diameter and gnarled with age. These trees are usually called basin-shaped, but an ordinary sugar-basin with a short stem more truly represents their shape. The stems are from fifteen to eighteen inches high, and the branches radiate from these in an outward direction to a distance of from four to seven feet on each side, and by a perfect system of training and pruning they form a complete circle eight to fourteen, or even more, feet in diameter. The trees are trimmed to a flat top some five feet high, and to one looking across the great plantation not a branch is seen above this line. By summer and winter pruning these trees are kept in this shape, and the branches are closely covered with spurs, from which the nuts are produced. No suckers are seen, and something like three hundred trees may be grown on an acre, but the number varies according to the size. Many of the trees will produce ten pounds of nuts.

In the autumn of 1893 we mentioned the fact that the so-called Rose-colored Calla, *Richardia Rehmanni*, had flowered in Holland, and that the spathes as they appeared there were described as white, tinted with rose. In one of Mr. Watson's letters of January of last year it was stated that a colored picture of the plant as it grows in Natal showed that there is a variety of the plant there with spathes of dull rose-purple. In October last we gave an account of the flowering of the plant in Kew, where it showed nothing more than a flush of rose-

color inside of the upper portion of the spathe. The last number of *The Garden* gives a picture of this plant in flower from a photograph sent from Holland, from which the appearance of the plant is shown to be quite different from the ordinary Calla, although it is a true Richardia. The distinct feature of the plant, as we have noted, is the lanceolate form of the leaves, which resemble somewhat those of a Canna, and the spathes are striped, as they unfold, in a way which reminds one of Jack-in-the-pulpit. The color of these stripes is said to be chocolate-brown, while on the inside the spathe is said to be a soft rose-color. It is suggested that the difference between the color of this flower and of the flower of the Kew plant may be due to the fact that one came from a much more southern latitude than the other. It is not improbable that the Rose Calla needs a hot sun to bring out its distinctive color, and it might do its best in our southern states. It is plainly less desirable than the white Richardias, and even than the yellow-spathed species. Nevertheless, it may be useful for hybridizing, and may found a race with a range of color quite distinct from any we now have.

At the semi-monthly meeting of the Massachusetts Horticultural Society, on February 2d, there was a fine display of cut blooms of Orchids from the Ames collection at North Easton, including first-rate examples of white forms of *Lælia anceps*, one called *Vestalis* being remarkably good, and another called *Winniana*, one of the darkest of all the varieties of this winter-blooming *Lælia*, was specially good. Mr. Robinson, the gardener, also showed a fine hybrid *Cypripedium* of his own raising, and named after Mrs. F. L. Ames, a cross between *C. Fairieanum* and *C. tonsum*, the latter being the seed parent. The hybrid showed plainly the parentage, having the characteristic petals of the charming pollen parent, with the shining surface over the whole flower that is so marked a feature of *C. tonsum*. Another hybrid raised in the same collection was shown, it being the North Easton variety of *Cypripedium H. Ballantine*, a charming little plant, having for its parents *C. Purpuratum* and *C. Fairieanum*. There were also a collection of cut blooms of Orchids from Mr. John L. Gardiner, of Brookline. Cut blooms of Camellias were also shown in quantity, chiefly by Francis B. Hayes, and made a fine display. The competition for the prizes offered for Violets was good, and the first prize was well merited by those shown by Mr. W. N. Craig, of Taunton, but the two vases of Marie Louise, shown by Alexander Mackay, of South Framingham, were, perhaps, the largest of their kind ever shown in Boston, the flowers easily covered a silver dollar, and the color was superb, eclipsing all other varieties on exhibition. There was also another promising kind, shown under the name of the Farquhar. A good display of Carnations was staged, the first prize going to the noted specialist from Framingham, Mr. W. Nicholson, and the second prize to Mr. W. N. Craig.

The second period of freezing weather in Florida was even more disastrous to the Orange groves than the first, when, as we have stated before, the crop of fruit was practically destroyed. The older trees, which had not been killed, had begun to put forth leaf-buds and fruit-buds, and this second cold wave has evidently destroyed these and apparently ruined the next crop. The cold weather has also hurt the crop in Spain, so that now nearly all the oranges in this market are from Sicily and Jamaica. From the latter island some very good fruit is coming, and this is here repacked in boxes like those used in Florida. The California orange season practically begins when the Florida season ends, in February, and continues through the spring months. Of course, the short crop elsewhere will make prices of California oranges high, so that this season's crop in that state will be unusually remunerative. The best California Navels which are now here seem to be of unusually good quality and they sell by the box for \$2.50 to \$4.50; good ones bring sixty-five cents a dozen. This unprecedented cold weather throughout the south has disorganized the vegetable market, and the supply here comprises hardly any fresh green vegetables besides the ordinary northern winter sorts and limited quantities of a few kinds from northern hot-houses. Hot-house tomatoes cost from sixty to eighty cents a pound; new carrots, forty cents for a dozen bunches containing five of these small but tender vegetables; radishes cost five cents a bunch, and tiny fresh onions the same price. Kohl-rabi, from Bermuda, rhubarb grown under glass on Long Island, and very slender stalks of hot-house asparagus, costing \$1.25 for a small bunch, are other luxuries seen in the best markets. The heavy snows have seriously interfered with transportation, and the large supplies of kale and spinach which come from Norfolk, Virginia, have been cut off for the time.

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLES: —Defacement of Parks in Buffalo.....	71
Charts of Tree Leaves	72
Botanical Notes from Texas.—XXIV.....	E. N. Flank.
FOREIGN CORRESPONDENCE:—London Letter.....	W. Watson.
NEW OR LITTLE-KNOWN PLANTS:—Gladiolus tristis concolor. (With figure.).....	73
PLANT NOTES	74
CULTURAL DEPARTMENT:—Cultivating the Persimmon.....	J. Troop.
The Grafting.....	W. Downs.
Preparatory Work.....	W. H. Taplin.
Novelties in Annuals.....	J. N. Gerard.
Notes from the Harvard Botanic Gardens.....	Robert Cameron.
Damping Off.....	Michael Barker.
Peristrophe speciosa, <i>Strobilanthes isoplathys</i>	Robert Cameron.
CORRESPONDENCE:—California Orange Groves.....	William F. Tisdale.
A Venturesome Hepatica.....	H. J. S.
A Search for Gold Thread.....	M. L. D.
MEETINGS OF SOCIETIES:—Western New York Horticultural Society.—IV.....	79
NOTES.....	79
ILLUSTRATION:— <i>Gladiolus tristis concolor</i> , Fig. 10.....	75

Defacement of Parks in Buffalo.

IN the annual report of the Buffalo Park Commissioners for 1891 the Superintendent complained that in the various minor squares, and to a certain extent in the larger parks, the plantations were suffering serious injury not only from thoughtless trespassing, but from purely malicious mischief. This complaint has been repeated by the Superintendent in every successive report, and in that for 1894, which has just come to hand, the Commissioners themselves say that in The Parade the greensward is so cut across with beaten tracks and the general aspect of the grounds is so shabby and forlorn that the place is an offense to the eye and an affront to common decency. But, worse than the destruction of the park, is the debasement of the public sense of right and wrong in this matter, for the Commissioners declare that it is useless to attempt any renovation of the place until a higher standard of public duty has been established. Trees, shrubs and plants are mutilated in broad daylight, lawns are seamed with ragged paths, outrages against common decorum are committed, and park ordinances are contemptuously ignored. Inasmuch as there are only seven patrolmen for the whole park system of the city, whose business it is to preserve order in as many widely separated parks, the police force is evidently not responsible for this lawlessness. And, even when arrests are made, public sentiment, expressed through the courts, sustains petty trespassing, and the offender knows that if he is arrested the Judge will be as likely to reprimand the patrolman for making the arrest as to punish the offender for the destruction of the public property. Under such conditions, all attempts at creating or maintaining anything like landscape beauty is a mockery, and all money spent for this purpose is worse than wasted. This vandalism is worse in one park than in others, but it is gradually spreading to all, so that, in the language of the report, "the standard of keeping for all the parks must finally be such as can be maintained on the sufferance of the meanest vandals of the community."

When the project of building a park in the centre of Manhattan Island was first suggested, some good men considered the scheme preposterous, because, as they asserted,

it would certainly be made the field for the rough sport of the more depraved elements of the community. Wiser men held that a beautiful piece of scenery would largely be its own protection, and such a public regard for it would soon develop, that protection from thoughtless or malicious injuries could easily be secured. Of course, the city did not begin by putting a hundred acres or so of park land under the control of a single policeman, for wherever there is a proper regard for any pleasure-ground there will be a public sentiment which will ensure an adequate force for its safety. But at the very outset there never seemed to be a disposition to deface Central Park, or if there was, prompt suppression in the beginning prevented the growth of such a lawless sentiment. This has been the experience of most American cities. In San Francisco, where there are more showy flowering shrubs and trees in the parks than there are in any other American city, we have never heard of any trouble of the kind. There is no such trouble in Boston in the parks or in the Public Garden; there is none in Brooklyn, none that we ever heard of in Philadelphia or Baltimore. Even in Chicago, where the original design of the parks has been ignored, and where some of the ground has been treated in the most vulgar way by the managers, the condition of things is not so bad as it appears to be in Buffalo from the report of its own officers.

It is not to be assumed that the people of Buffalo are less law-abiding than the inhabitants of other cities, but in this one particular the community offers a striking example of the demoralization which invariably comes when offenses, which seem trivial at first, are permitted, until their constant repetition without reprimand or punishment invests them with the character of privileges and inalienable rights. The trespasser justifies his action by the statement that the people own the parks and, therefore, the people have a right to use them as they choose. The correct statement of his reasoning is that since all the people own the parks, therefore any one of the people can do with them as he pleases, and this is the essence of anarchy. The popular cry against boundary fences as obstacles which prevent the people from enjoying the parks—that is, barriers which prevent one man from entering the city property at any point he may prefer—and the cry for the free use of the turf because everybody owns the park meadows, and, therefore, anybody has a right to walk upon them, are both examples of this individual self-assertion which does not recognize the fact, which is the basis of civilized society, that a community has an organic life of its own, and that each man owes it respectful and loyal obedience. Every sensible man in Buffalo knows this, but there are some people in that city who have walked where they pleased so long that they now resent as a violation of their natural rights any attempt to restrain them from making paths across the turf, and the persons who have been permitted to break shrubs and carry away flowers for a time have come naturally to believe that the shrubs are planted for this purpose exclusively.

It seems that there was once a wooden fence, which in some measure protected one park from wear and defacement. When this began to need repairs it was broken at every point where any one wished to enter or cross the ground, and public sentiment had become so firmly set against a fence that no appropriation could be obtained for one. Of course, the park is completely wrecked, but the debasement of public morals is much more serious than the damage to turf or trees, for this generates and develops a spirit which ultimately makes all public property unsafe. The enlightened people of the town must realize that something should be done promptly to regenerate the public morality in this particular. Such a sentiment ought to make itself quickly felt by strengthening the protective force of the parks and by compelling judges to enforce laws against trespassers. It will be much harder to do this now, since these laws have been so long violated with impunity. But a beginning should be made at once. The public parks of our country in rapidly growing cities

are subjected to enough dangers, at the best, from threatened invasion and confiscation. But where the people stand by and see well-planned and beautiful parks turned into desolation, and property of unspeakable value to rich and poor laid waste, without any attempt to arrest the injurer, and even without protest or indignation, the case seems almost desperate. When parks become utterly abandoned and left a prey to trespassers, it would be a wise policy to run streets across them, cut them up into building lots, sell them off and put the money in the city treasury.

We have received a chart of life-size pictures of the leaves of some of our native Oaks, and the drawings give proof of accurate observation of the subjects in all stages of their growth. This tree-leaf chart is printed on good paper, and a prospectus gives the information that others are to follow, containing the leaves of other families, and including the most valuable deciduous shade, nut and timber trees, native and foreign, which are adapted to our northern and middle Atlantic states. If these charts could be hung up in the school-room they would be an admirable help to pupils who wish to identify the various species and varieties of trees about them, and a skillful teacher could make a great use of them in encouraging habits of observation among the young. They would not only be useful in the school-room, but in the family circle, and they would familiarize children with the various forms of leaves and help to interest them in the study of our native trees. The drawings are made by Grace Anna Lewis, of Media, Pennsylvania, and the charts are sold at the moderate price of fifty cents each.

Botanical Notes from Texas.—XXIV.

CHEROKEE COUNTY lies in the central portion of eastern Texas, and a few years ago it was prophesied that its capital town, Rusk, was to become the chief iron-manufacturing city of the south, if not of the United States. Much money was spent in erecting furnaces, hotels and long brick blocks, and streets were laid out for long distances through the surrounding country, but the fires have gone out in the furnaces, while hotels, business houses and many dwellings are deserted. Valuable ore of iron is here in great abundance, it is true, and later on it will be brought into use, but the markets of the world do not need it yet.

This county and the adjoining ones are, perhaps, the best peach-growing region in Texas. A hundred car-loads of this fruit were shipped from Jacksonville alone last year, besides supplying the canning factories there. This is a small amount, it is true, but the industry is young yet. The best fruit-lands here are on the sandy tops of the iron hills; there the young fruit escapes injury from early frost, while in the valleys it may wholly be destroyed. This branch of horticulture is capable of indefinite profitable extension throughout eastern Texas. The practice of raising Peach-trees, largely from seeds, has developed many varieties of excellence hardly anywhere surpassed. The latent energies of the Peach, even after so many centuries of cultivation, is not easily to be overestimated. A species, that by a bold and successful effort at bud-variation, could develop so remarkable a variety as the Nectarine, is liable to perform still greater wonders in the future.

As the tourist goes over Texas he is surprised to see to how great an extent Cotton is still the field-crop of the state. The season of cotton-picking extends over the last six months of the year. The entire cotton product of Texas aggregates an immense sum of money for the state; that amount, divided among the owners of four millions of acres of land and the renters of it, the laborers, the pickers, the ginners, the oil men, the weighers, the buyers, the commission men, the railways, the storers and the shippers, does not leave a large sum for any of them. Those who fare the best seem to be the landowners, who are generally merchants, bankers or men of other professions living in

the cities, and those who handle the crop after it is raised. Profitable or not, the present condition of affairs will only slowly change. Cotton is the surest money-crop of the south, and, therefore, many farmers are obliged to raise it, even though they buy the necessities of living, which they might otherwise raise for themselves.

Witch Hazel, *Hamamelis*, is not so distinctively a fall-flowering shrub, as some botanists have written it. Differences of climate and soil may change the living ways of plants, as they change the living ways of animals and of men. A long residence in Texas has taught the Witch-hazel that it need not blossom in the fall, that it will have time enough to effect fertilization and to ripen fruits and seeds in the same year, and therefore the flowering is put off until February, and even later, and then have time to perfect seed before the year closes. That peculiar Sunflower, *Helianthus angustifolius*, abounds in eastern Texas from the Gulf to Red River. An interesting feature of the woods of this section in the early fall is the handsome fruit of French Mulberry, *Callicarpa*. A wine, or more properly a cordial of successful intoxicating quality, has been made from it.

One day as I was walking along one of the railways leading out from Jacksonville, I recognized the fragrance of the Sweetbrier, and soon saw a lusty plant of *Rosa rubiginosa* by the wayside. It was the only individual of the species that I had seen in Texas. It is rarely found wild in Kansas. In New York it is common along roadsides. *Lobelia puberula* is common here in damp places. It resembles *L. siphilitica* more than any species of the genus, but it is taller and slimmer than its congener.

The handsome Pink, *Spigelia*, is frequently seen in this county. It is the Pink of the medicinal firm of Pink and Senna, and the species, for its beauty, is worthy of a place in the wild corner of any garden.

Solidago odora is the commonest as well as the handsomest Golden-rod of eastern Texas, and often three to five feet tall. It is handsome enough for any garden, and pleasantly and so strongly odorous as to fill the air with its fragrance. Of our native species of *Solidago*, *S. tortifolia* resembles it most closely.

I met *Hydrolea affinis* near Jefferson, for the first time in Texas. *H. ovata* is much more abundant. They are rather handsome plants with spiny stems and bright blue flowers. The last-named species has a very downy calyx, a character which its congener does not possess. The Wild Turnip, *Arisaema*, Jack-in-the-pulpit, grows in this vicinity by the side of its homelier but commoner congener, *A. Dracunculus*. The family garden has no longer a corner for medicinal herbs, and strings of wild turnips no longer adorn the chimney-corner, for, though we are told that those bulbs lose all their virtue in drying, yet grated and mixed with honey or maple-molasses they were once thought to be a sovereign remedy for colds and coughs, especially in the case of children. In those earlier days, too, when the tea-canister was empty and the supply of coffee had been exhausted, the same closet contained dried roots of Water-avens, *Geum rivale*, a decoction of which, drank with milk and sugar, was no mean or unpleasant substitute for the costlier drinks.

Among many distinguished tree foreigners who have taken out naturalization papers in the United States, some of whom are living in eastern Texas, is *Paulownia imperialis*. That species has been largely planted for ornament, and has quickly run wild. Foreign plants as well as foreign people are rapidly taking possession of many parts of the country. We are loath to admit the Chinaman, but we freely admit the China tree to naturalization, and not only *Melia*, but also *Paulownia*, *Ailanthus*, *Sterculia*, *Stillingia*, *Albizia* and others. The new forests of the south are likely to be largely of Mongolian extraction. It is strange that so unique and handsome a foreigner as *Ginkgo biloba* is seldom, if ever, seen on Texas lawns.

Two humble Asiatic plants, that probably came to the United States uninvited, are working a silent but important

change in southern agriculture. Those plants are Bermuda Grass, *Cynodon Dactylon*, and Japanese Clover, *Lespedeza striata*. Pity it is that part of the common name of the last-named species should be a misnomer, as the plant is not a Clover. Both of those plants have largely spread over the more eastern Gulf states. They will soon cover most of Texas. They are hardy and excellent forage-plants. Bermuda Grass, as a plant fully able to take good care of itself, will prove a great boon to the farmers of Texas. As a food for all live stock, as a shelter and a fertilizer of the soil, to hold the dew and the rain, and to prevent washing of soils and embankments, it has no superior. It is no wonder that in its native India, where it is more needed even than in Texas, the Hindoos rank it among their plant gods, and ascribe to it terms of reverence and worship. There have been many meaner things worshiped than Bermuda Grass.

Gainesville, Tex.

E. N. Plank.

Foreign Correspondence.

London Letter.

NOTES ON ARISÉMAS.—A collection of these plants makes an interesting feature at Kew during the early months of the year, when most of them flower. Over twenty species are represented, out of a total of about fifty, which are distributed over the temperate and tropical regions of Asia, chiefly the Himalayas, and one is North American. Some of these deserve to rank with good garden-plants, though as yet they have received little attention from horticulturists—in Europe, at any rate. All the species have tuberous root-stocks similar to the Caladiums, which they also resemble in losing their leaves and resting for a period every year. In some species the leaves are folded at the base, so as to form a sort of stem, and the blade is trisect or pedate. In form and coloration the leaves are generally ornamental, the stalks being mottled or striped, and the leaflets margined with pink or brown. The inflorescence is in the form of a trumpet or funnel, one side being prolonged to form a long flap or hood, the tip of which is sometimes a long hair-like tail. In color the spathes vary, some being green and brown, others purple, with white stripes, others red-brown, and so on. The spadix in some of the species is often very long and filiform, and sometimes is clothed with long setose hairs. The flowering season extends over about two months. None of the species have a disagreeable odor when in flower. A vase filled with a collection of the flowers of Arisemas is a pleasing and uncommon object. The plants at Kew are started into growth in January, when the tubers are shaken out of the soil in which they have been at rest since the leaves died away in July or August, when they were placed under a stage in a cool greenhouse. The tubers are cleaned as if they were Caladiums, and then potted, either singly or several together, in a mixture of peat, loam, leaf-mold and silver sand. The tubers are buried two inches below the surface, and the soil only slightly pressed about them. They are then placed on a tan or cocoanut fibre bed in a greenhouse where the atmosphere is moist and the temperature falls to about fifty degrees in cold weather. As soon as the growths push through the soil the whole should be well watered and afterward kept moist, these plants being, if anything, swamp lovers in a state of nature, as, indeed, are all tuberous-rooted Aroids of which I know anything. Should the fleshy white roots push above the surface of the soil a top-dressing with cow-dung and loam may be given. When the spathes open, the plants may be placed in the conservatory or a cool greenhouse. When the flowers fade, the plants should be encouraged to keep green as long as possible, so as to insure good tubers for the following year.

The American Indian Turnip, or Jack-in-the-pulpit, *Arisëma triphyllum*, grows well, and flowers annually here in a border against a south wall outside, its companions being the Sauromatum and Arum crinitum. These are left in the

ground undisturbed year after year, and never suffer from cold. The position is one where the soil is always rather moist, a condition that appears to suit them.

The following are the best of those species grown at Kew during the last ten years:

ARISÉMA SPECIOSUM.—This is a beautiful plant, and as easily cultivated as a tuberous Begonia. It is a native of the Himalayas at from seven to ten thousand feet, and was first introduced in 1872, when a figure of it was published in the *Botanical Magazine*. It has since been figured in the *Gardeners' Chronicle* and *The Garden*. It produces one, sometimes two leaves, the petioles of which are two feet long, brownish green, with whitish marbling; the blade is tripartite, the leaflets each a foot or more long, nearly half as wide, narrowed at the apex to a tail-like tip, wrinkled and colored dark green, with a reddish margin. The spathe is erect on a stalk about half a foot long, and measures from the base to the top of the hooded portion six or eight inches, beyond which there is a tail two inches long. The spadix for four inches from the base is as thick as a man's little finger; beyond that it is a thin filamentous tail from one to two feet long. The color of the whole is rich vinous-purple, with lines of grayish white running from the base of the spathe upward. The purpose of this tail attached to the spadix and reaching to the ground is supposed to be to lead crawling insects up to the flowers to aid in fertilization. A remarkable character in this species is that of being sometimes monoecious and sometimes dioecious. It ripens seeds under cultivation.

ARISÉMA FIMBRIATUM was introduced from Penang in 1884, when figures of it were published in the *Botanical Magazine* and elsewhere. Recently Messrs. Sander & Co. have imported it in quantity. It has a solitary leaf, three ovate acuminate-tailed leaflets of a rich green color borne on a red-brown petiole a foot long. The spathe is six inches long, hooded, the lower portion light green, with white stripes, the upper purple and white; the spadix is thin and tail-like, hangs down to a length of six inches, and is clothed with blackish bristle-like hairs an inch long. This species requires stove treatment always.

ARISÉMA FILIFORME is a Malayan species of recent introduction. It has pedate leaves, the leaflets lanceolate-acuminate, sometimes a foot long, the petiole red-brown, with gray marbling. The scape is two feet high and bears several smaller caudine leaves; spathe-tube two inches long, green, shading into brown; limb five inches long, two inches wide, hooded and colored dark brown, with a metallic-green shade; spadix six inches long, the upper portion narrowed into a smooth brown tail-like appendage. Though wanting in brilliancy of color this is a handsome stove plant. It should be always kept in the stove and moist. At Kew it does not die down, in which respect it resembles *Richardia Æthiopica*. I do not see any difference between *A. filiforme* and *A. Wrayi*, of which there is a figure in the *Botanical Magazine*, t. 7105, beyond that of color, the spathe of the latter being pale green, almost white in places, and the tail a little longer. They are alike in habit and stature and in behavior under cultivation. Both of them are in flower at Kew now.

ARISÉMA GRIFFITHII-HOOKERIANUM was introduced and flowered in 1879 by Mr. H. N. Elwes from the Sikkim, Himalaya. There is a figure of it in the *Botanical Magazine*, t. 6491. It has a large tuber, usually two leaves, the petioles of which are a foot long, half an inch in diameter, smooth and green; the three leaflets are nearly a foot long, six inches wide, dark green, tinged with yellow along the margins. The flower-stalk is short, and it bears an erect spathe, which is tubular below and colored black-purple, with paler stripes; the upper portion is hooded six inches across and curiously inflated on each side, suggesting the puffed-out shoulders of a lady's dress of the present fashion; this portion of the spathe is dark purple, with green reticulating veins. The spadix is thick at the base and elongated above into a hair-like appendage, which is sometimes three feet long. This is one of the most remarkable

plants in the order, the structure of the spadix being as singular as that of the pitcher of *Darlingtonia Californica*.

ARISÆMA MURRAYI was introduced from Bombay in 1847. There is a figure of it in the *Botanical Magazine*, t. 4388. It has large, potato-like tubers, a solitary leaf, the stalk of which is eighteen inches long, green, mottled with red-brown, and the leaflets are oblong-acuminate and six inches long; the spathe is five inches long, with a green tube, the upper portion white, curved over and forming a hood, the sides of which are purple. The spadix is short and wholly enclosed in the spathe.

ARISÆMA UTILE is a native of the Himalayas, whence it was first introduced in 1879. It resembles *A. Griffithii* in all its characters except that the spathe is smaller and is chocolate-brown in color. By some the two are considered to be only forms of the same species. Sir Joseph Hooker found it at an elevation of 13,000 feet in Sikkim; it may therefore be hardy, but I have never seen it tried out-of-doors. Sir Joseph Hooker says it is the commonest species in Sikkim, where its tubers are used as food by the hill tribes after they have been macerated and boiled.

ARISÆMA NEPENTHOIDES is another Himalayan species which was first cultivated here in 1879. It has a large turnip-like tuber, leaves two feet high, with the blade divided pedately into five oblong tailed leaflets, and the stalks colored green, with dull red blotches. The flower-stalk is nearly as high as the leaves, and the spathe is erect, six inches long, shaped somewhat like the pitcher of a *Nepenthes*, colored brown, the upper portion folded over, forming a tailed flap, colored yellow-brown, the ears green and brown, with dark spots; the spadix is erect, shorter than the tube and whitish in color. This is altogether a pleasing plant in the singular coloration and elegant form of its spathe. It is very easily kept in health.

ARISÆMA RINGENS (*præcox*) is a Japanese plant which has long been in cultivation here in the gardens of the curious. At Kew it is planted among Sikkim Rhododendrons, etc., in the large temperate house, where it produces very large lustrous green trifoliate leaves and large hooded flowers, which are green, with white stripes on the outside, black purple, with white stripes inside. The top of the spathe is folded over and then contracted, so as to form two round window-like apertures, one on each side.

W. Watson.

London.

duced thirteen leaves from the small corms which this species appears to produce freely, like several other *Gladioli*, on top of the old corm. The leaves were about two and a half feet long, and six of them bore flowers, indicating the free-flowering quality of this species, which is certainly one of the best winter-flowering decorative plants which have come under our notice for a long time. Its free habit and the size, beauty and fragrance of the flowers should commend it to florists as a good companion for the Freesia, which this *Gladiolus*, although it does not produce so many flowers on a stem, surpasses in their size, form and coloring. It grows so freely in a low temperature, too, and can be had in flower so early in the winter, that it would be a cheap plant to raise; and it is not improbable, too, that it would make a good house-plant, although on this point we speak without experience.

Plant Notes.

BORONIA MEGASTIGMA.—In the early volumes of GARDEN AND FOREST we frequently called attention to this Australian shrub particularly for the delicious, and yet intense, fragrance of its flowers. At this season one or two plants will perfume a very large greenhouse, and a spray or two will pleasantly scent a large room. This shrub is about two feet high, the main branches being erect, and the opposite branchlets spreading, with flowers borne in the axils of the sparsely set narrow leaves. They are bell-shaped or semi-globular, solitary and pendulous, half an inch in diameter, of a reddish chocolate-brown, or, as the catalogues say, maroon-purple on the outside, and clear yellow within. In a general way it may be said that this *Boronia* needs a cool-greenhouse treatment, like the Cape Heaths, but when grown from cuttings these should be taken from the branches somewhat hard rather than the more sappy ones, and as the plants do not require much root-room small shifts are the best. When the plants are done flowering they are cut back, so as to make thick, stocky plants, and it is well to stop the shoots often to prevent them from running up into thin and rather scraggly specimens instead of well-furnished and compact bushes. It is essential that the pots should be well drained as they are shifted on, since stagnant water is very injurious. During the summer these pots can be plunged outside in a position where the midday sun does not strike them. Mr. Robert Cameron writes from the Harvard Botanic Garden that he takes cuttings from the moderately hard growth, plants them in four-inch pots which are filled with a compost of finely sifted loam, peat and sand to within an inch of the top of the pot. Over this is spread a layer of very sharp sand. When the cuttings are inserted they receive a thorough watering, and are then placed under a bell-glass in a greenhouse where the temperature ranges from forty-five to fifty, and are kept shaded from bright sunshine. The plants blooming in the Botanic Garden now, however, were raised from seed sown two years ago. Seeds germinate readily in the same temperature required for cuttings, and they soon make nice plants. A few years ago it was noted in this journal that Mr. C. M. Atkinson tried the experiment of cutting these plants back severely in spring and planting them out in the open air. They seemed to make a stronger and healthier growth than those kept in pots, and they flowered equally well.

CESTRUM ELEGANS.—The flowers of this rather old-fashioned plant are very attractive in the cool greenhouse just now. When grown in large pots, the plants make shrubs five feet high. The long arching branches, with their ovate lanceolate leaves, are terminated with large dense cymes of purplish red flowers. Besides its value for decorating the conservatory, the sprays are good for cutting. In spring the plants should be cut well back and repotted, and in May plunged outside in the garden, where they make good growth during the summer. They are taken back to the cool greenhouse in the fall, where they give a quantity of flowers during the dull months of winter. This *Cestrum*

New or Little-known Plants.

Gladiolus tristis concolor.

THIS plant, of which a figure is published on page 75 of this issue, was probably much more common in gardens in the early years of the century than it is now, as it is one of those south African bulbous plants which were once the delight of English gardeners, but now are well-nigh forgotten by the present generation of plant-lovers.

Gladiolus tristis concolor is one of the group of species distinguished by the oblong spatulate and acute segments of the flower and by long narrow leaves so strongly ribbed that a cross-section of one of them has the form of a cross. This variety only differs from the typical plant in the absence of spots from the pale yellow flowers, which are marked down the middle with a narrow band of rather deeper yellow. The flowers, which are nearly two inches across the expanded segments, are produced in loose, elongated, two to three flowered panicles, enclosed at the base by the dark green leaves, and, although nearly scentless during the day, exhale a delicate, fragrant perfume in the evening.

The plant from which Mr. Faxon has made the drawing, which is reproduced in our illustration, was raised from a corm sent to us by Mrs. Elwood Cooper, of Santa Barbara, California, in whose delightful garden this *Gladiolus* is well established, flowering there profusely in the open ground in the early spring months. It was potted at the end of September and placed in a cool greenhouse, where it pro-

does well in rich loam, and in winter requires a position where it can get plenty of light in a greenhouse where the temperature ranges between forty and forty-five. It can be grown from cuttings, which root very easily if given a little bottom-heat and shaded from bright sunlight.



Fig. 10.—*Gladiolus tristis concolor*.—See page 74.

IRIS RETICULATA KRELAGEI.—Bulbs of this Iris, which were set out last autumn, will now be in bloom in a cool and sunny greenhouse. Like others of the reticulata group, they will endure more heat than most hardy Irises, and can

be forced into bloom earlier if necessary. The flowers of this plant are a reddish purple, although they vary considerably in shade, and the claw is veined more conspicuously than in the type, and it has a yellow crest. The colors generally are not as attractive as are those of several other varieties of *I. reticulata*. Mr. Michael Barker writes of some of these plants now in bloom at Cornell University, that their leaves are four inches long and the flowers an inch and a half in diameter. Mr. Barker, in his *Handbook of the Irideæ*, says that this variety is the common wild form of the Caucasus, and Professor Foster suggests that it might be regarded as the typical form, since what is known as the true *I. reticulata* is rarely found among imported bulbs, and when crosses are obtained between the type and Krelages variety, the seedlings chiefly follow the characteristics of the latter. Several bulbs are often planted in a single four or five inch pot, but this is an undesirable method, because the bulbs vary greatly in time of their flowering, and there is a remote chance that any three or four would be in bloom at the same time. They should be planted singly in small pots.

Cultural Department.

Cultivating the Persimmon.

In vol. i., page 514, of *GARDEN AND FOREST*, Charles Naudin speaks briefly concerning the improvement of North American fruits, confining his remarks principally to the Papaw, *Asimina triloba*, which he characterizes "the best of the wild indigenous fruits of North America." In a foot-note the editor added the Persimmon, *Diospyros Virginiana*, as being well adapted to cultivation and improvement, and he remarked that "there seems to be no reason why the American Persimmon cannot in time be made to equal the Japanese varieties in size and flavor." But little attention seems to have been given to the subject, however, by fruit-growers, and persimmons still remain among our neglected wild fruits. But we have recently inaugurated a series of experiments in this state, and Illinois has done the same, which have for their object the improvement of these fruits, both of which are indigenous to this state, the Persimmon being especially adapted to the soil and climate of the southern half of each, but it grows to some extent further north. From the latitude of Indianapolis southward it grows luxuriantly without cultivation, but the fruit is generally small. Heretofore suckers have been used almost exclusively in propagating, but these experiments will include budding and grafting the better varieties as well as cross-fertilizing with a view of improving the fruit by increasing the size and reducing the number of seeds and improving its flavor. The work will be done mostly at one of our substations.

In speaking of this fruit at a farmers' institute, Mr. O. M. Hadley said that, although this fruit has been so sadly neglected in the past, it is certainly a fruit that should be better appreciated by all, for it has many desirable qualities. The tree is usually small, but has in some instances been found to reach a height of seventy feet. We rarely find it fruiting north of the forty-second parallel. There are various reasons why it has been hitherto neglected. One is that, in most instances, suckers or seedlings have been used for planting, and these generally die, or, if they live, they produce inferior fruit or prove to be sterile. Another discouraging feature is that it requires a long time for the trees to come into bearing. But, since new modes of propagation and cultivation have been introduced, the persimmon has become a fruit upon which we can rely. Sprouts and seedlings should no longer be used. We might as well rely upon seedling Apples, Pears and Plums as upon seedling Persimmons, for nearly every seed will produce a new variety, differing from the parent fruit in size, shape and quality. In the present method of propagation, seedlings are grown till one or two years old, and they are then budded and grafted. In this way, when one chances to strike an unusually desirable variety, he may reproduce it to a certainty. Then he does not have to wait ten or fifteen years for a tree to begin bearing, for we now have a number of varieties which begin to fruit in from three to five years from the graft. Our best persimmons ripen without frost, contrary to the general opinion that no persimmon is fit to eat until it has been well frozen. There are varieties that ripen in August. The Golden Gem and Early Golden, two of the best, ripen early in September. Many excellent varieties, however, do not ripen until late in October or November, and some even

fail to develop a desirable flavor until midwinter, but this makes them all the more valuable by extending the season. The early-ripening varieties are preferable because of their greater market value, since they present the best appearance, and have often sold for from six to eight dollars per bushel in the large cities. An important point to be considered in selecting a variety is the number of seeds found in each fruit. Most of our old varieties are full of large seeds; but in many of the newer varieties only two or three seeds are found in a single specimen, and some are entirely seedless.

The Persimmon is easily grown when once fairly established, but it requires careful handling at first. When well established we may expect the tree to live and bear an abundance of perfect fruit every year, for neither tree nor fruit is molested by insect or fungi, as are almost all of our other fruits. If one has an old tree which bears inferior fruit it may be top-worked in the same manner as the Apple, Pear and Plum. In this way one may soon transform the worthless tree into one bearing rich, luscious fruit. There are few people who are not fond of sweet, well-ripened persimmons; they are good when eaten from the hand; better with cream and sugar, and they are best of all when made into a pudding, as is done in North Carolina.

Experiment Station, Lafayette, Ind.

J. Troop.

The Grapery.

THE most troublesome insects in the grapery are the mealy bug and the red spider. In houses devoted exclusively to the Vine the first of these pests should never be seen, but since it is often necessary to use Grape-houses for other plants, the mealy bug will sooner or later appear, and once in it is hard to dislodge. This is the best season to attack it. All loose bark must be removed, but it is not necessary to peel the rods entirely, as is sometimes done. Only those pieces of bark which come away easily need to be removed, for these alone are apt to harbor the insects. The kerosene emulsion should be made into a wash for cleaning, not the rods alone, but the rafters, the walls, and, in fact, the entire house. Care should be taken to get it into all the crevices, and this will destroy all active insect-life. The old-fashioned method of painting the rods with a composition of clay, kerosene, sulphur, etc., is unnecessary, as well as unsightly, although it is still preferred by many, and if it is done thoroughly with a stiff brush, so long as the buds are not injured, it will be all the protection that is needed.

As the red spider thrives in a dry atmosphere, water is the chief means of its destruction. It is hard to get rid of during the hot summer, but copious syringing continued for a long time will usually suffice. I have repeatedly syringed Grapes until the berries were coloring, and I once found it necessary to wash off the insects with a syringe before the grapes could be used. Rain-water is the best for syringing purposes, since it contains no lime, which seems to be the cause of the spot when the vines are sprayed. A ripe bunch of grapes can be cleaned without disturbing much of the bloom by holding the syringe over it and giving it a sharp spray in the middle. As soon as the red spider shows itself, which can be easily determined by the reddish tint of the foliage, and the pest rarely appears until after the Vines have flowered, the pipes should be made warm in the evening and painted with lime and sulphur, although care should be taken that they do not get too hot. This treatment must not be resorted to during the flowering period nor after the grapes begin to color. The house should always be kept well damped, except in dull weather. On one occasion I had nearly cleared a grapery of the spider by washing it with hot water. It was an old-fashioned house, and we took the rods outside and thoroughly cleaned the interior, painted the sash-bars and walls with kerosene, and afterward gave them a coating of lime-wash.

There should never be any intermission in the vigilant watch against these insects. Many persons neglect their Vines after the fruit is gone. If it is practicable they should have copious spraying for some time longer and all the air possible. In addition to the remedies mentioned, painting a house is always a great help.

South Lancaster, Mass.

W. Downs.

Preparatory Work.

AT this season much can be done in preparation for the outdoor garden, since many plants can be more readily propagated now than at any other time.

A border of old-fashioned flowers is a pleasing feature in itself in many gardens, and, besides, furnishes flowers suitable for cutting. Among plants for such a border, especially if it is intended to hide an unsightly fence, Hollyhocks

are useful, some of the improved varieties forming massive spikes of brilliantly colored flowers. They can be easily propagated at this time by cuttings. If a few old roots are placed in pots or boxes in a moderate heat a number of shoots will soon be thrown up. These shoots can be taken off when they have made three or four leaves, and rooted in a sand bed. After they have become established they should be placed in a cold frame until planting time.

The garden varieties of Phlox are also particularly effective in such a border. They supply a wide range of color, from pure white to crimson and purple, and in good soil the trusses of flowers are very large. They can be propagated, either by seeds, by cuttings made from the young growth, or by root-cuttings. The best method at this season is to use cuttings made from the young shoots. The stock plants should be treated in the same way as Hollyhocks. Cuttings of Phlox root in a short time if placed in a sand bed in moderate bottom-heat; but it is important that they should not at any time be allowed to wilt, either from want of water or exposure to too much sunshine.

Pentstemons also include a number of showy garden varieties that can be used advantageously with Phlox. Both are useful as cut flowers, and continue to bloom for a considerable length of time.

Among the plants that may be used for edging a mixed border of flowering plants none are more showy than dwarf Nasturtiums. I prefer, in this latitude, at least, to sow the seeds of Nasturtiums in their permanent position out-of-doors as soon as the weather will permit, instead of raising them in pots. The plants whose roots have not been disturbed seem to have more vitality during dry hot weather.

Torenia Fournieri, and its white form, known as White Wings, are also good plants for edging. They produce an immense number of flowers, but are most satisfactory when planted in partial shade. Seeds of these can be had from almost any seedsman, and should be sown as soon as possible to secure strong plants. Torenia-seeds germinate better in the shade than in full sunshine, and should be placed in a warm greenhouse. Canna-seeds should be sown at once; they will germinate much more rapidly in strong heat. The plan of soaking them in warm water for a day or two before planting them is a better way of preparing them for germination than that of filing a hole through the hard outer shell, as has sometimes been suggested. If a succession of Sweet Peas is desired, it is well to start some seeds in pots in the greenhouse. After hardening them off in a cold frame the seedlings may be planted outdoors almost as early as the seeds of the outdoor crop are sown, thus gaining two weeks or more in the time of flowering.

Holmesburg, Pa.

W. H. Taplin.

Novelties in Annuals.

FEW romances are more fascinating to one with gardening instincts than a first-rate florist's catalogue, and the fascination seems to increase with one's longer experience. Of course, there is always the familiar list in a seed catalogue, ranging from Abronias to Zinnias, of which we know each item, and most of which have been familiar at one time or another in the garden. But few catalogues are so poverty-stricken as not to offer within their usually vivid covers something which may appeal to the imagination as a possible prize. The more important catalogues always offer, apparently, sterling novelties well worth trial, and if these do not prove equal sometimes to the description, one is at least repaid by the enjoyment of them in anticipation, not to speak of the knowledge gained by experience. Sometimes the catalogue-maker paints his flowers in colors too lustrous, but usually it will be found that the descriptions are correct, as far as they go, although, as is natural, the weak points of a new plant are not insisted on.

As garden plans are now being made and selections for the coming seasons are in mind, a few remarks about the recent offerings of new seeds and plants may be helpful. These notes will be confined to plants and seeds easily secured and to those things likely to interest the amateur grower of a general collection of annuals, etc. A general review of the catalogues reveals an unusually small number of novelties in the more important annuals. No season ever passes without bringing forward some new China Aster, and this year one is offered of distinct form and striking character. This, which is known as "Japonaise," and offered by Vilmorin & Co. in rose and pink, is figured as a large flower, with long, very narrow-pointed, rather irregular petals, and much resembling a Chrysanthemum in effect. Of the recent China Aster the Branching or Candelabra Aster have proved valuable for their late-flowering and long-stemmed habits.

August-flowering China Aster have been much ravaged here lately by the blister-beetle, which devours the flowers as rapidly as they show color. The Yellow Aster should be rather highly colored. The strain of flowers offered this season is said to be of a clear sulphur-yellow. Aster of this color are offered at regular intervals, but previous introductions have always needed the eye of faith to discover the tint. This is an attractive novelty, but it may be said that the sulphur-yellow of the florist usually proves to be a lurid yellow, very ineffective and unpleasing. There are others—The Lady in White, etc.—but few of the annual introductions of Aster prove to be improvements on the standard old varieties, which cost only a trifle, and whose colors are pure and forms entirely satisfactory.

A Wallflower is offered which is said to flower in three months from seed, with the quaint coloring and delightful fragrance of the old favorite, of which we never have too many in the garden.

Sweet Peas have become so important, and are in such demand, that we have the usual number of new varieties, the most important of which seems to be Blanche Burpee, a white-seeded white variety, said to be of very pure color and fine form. This is an Eckford variety. Reports of trials by growers do not indicate that it is superior in purity of color to Emily Henderson, though of slightly different form. California, in recent years, has become the nursery for Sweet Peas, for nowhere else does stock increase so rapidly. In consequence we are now able to secure quickly all the new varieties at moderate prices, and no longer have to wait some years, as we once did, while stock was being worked up in less genial climates. Growers of Sweet Peas have noticed lately that there has been a tendency to produce double flowers among the modern improved varieties, and this year we are offered for the first time seeds of double Sweet Peas, said to produce fifty per cent. of double flowers. This will interest some growers and irritate some purists. To me the double flowers seem to be neither more or less beautiful than the single ones. If one has a greenhouse or warm frame, seeds of Sweet Peas may now be sown singly in thumb-pots with large drainage holes. They readily germinate, and if the pots are set on loose earth the roots will work into it, and it will not be necessary to repot. The plants will be in good condition to transplant as soon as the garden can be worked. This inside planting is particularly useful for the white-seeded varieties and where the garden is too cold and wet to permit of early planting.

Without prejudice I should say that double-flowered Morning Glories, *Ipomoea purpurea*, seeds of which are offered, are curious, not pretty. Those which I have tried have produced a moderate number of flowers with numerous confused petals among a wealth of foliage. The flowers, unlike other *Ipomoeas*, are rather lasting. There are many *Ipomoeas* offered this year, and one can seldom go amiss on Morning Glories, with their usually pure colors. Every one should grow the variety or species which has lately been reintroduced as the "Heavenly Blue," the true *Ipomoea rubro-caerulea*, a most striking and delightful flower.

Those who fancy double Petunias are likely to be very much pleased with the "Double Giants of California," as they possess all the merits of the ordinary double flowers in an enhanced degree, being as large as Hollyhocks. Single Petunias, which have their uses in the garden, have also been transformed in California, and the new strains are now well fringed and as big as any one could desire.

Of other important seeds not new, but still in the novelty lists, *Nemesia strumosa* is a Cape annual with very attractive flowers, which seems to have been little grown yet. The seeds are somewhat like those of Stocks and easily ruined in the seed-pan by overwatering or too much warmth.

Begonia Vernon has proved to be such a good bedding plant that other forms of Begonias for the garden are likely to excite interest. *B. Erfordiae* is said to be a cross between *B. Schmidii*, a well known free-flowering kind, and *B. Vernon*, which is a form of *B. semperflorens*.

Hibiscus Sunset, a tender perennial said to flower the first season, seems to have attractions and to be worth trial. The flowers are creamy, with a crimson maroon centre. A form of same character tried by me last season grew very vigorously.

The other offerings of the season are of minor interest, being mostly new varieties of less important flowers. I notice a new strain of climbing Nasturtiums, called *Madame Gunter hybrids*, but my experience with these has been that they are very vigorous and bright-colored, but no more so than the strains usually offered by our best seedsmen.

Saintpaulia ionantha of last year, still in the novelty list, is a charming little African gesneriaceous plant, which is, of course, to be grown under glass. It is a quaint little plant, forming a rosette of attractive leaves, crowned with small purple single flowers and producing a pretty effect.

Elizabeth, N. J.

J. N. Gerard.

Notes from the Harvard Botanic Gardens.

BRUNFELSIA (FRANCISCEA) LATIFOLIA is a handsome and very satisfactory stove shrub. It makes a shapely plant three to four feet high and produces an abundance of lavender-colored flowers about this time of year. Its leaves are broad, elliptic and acute, four to six inches long and about two inches broad. The deliciously fragrant salver-shaped flowers are produced at the ends of the branches. Of a lavender color when they first open, they become almost white in a day or two. *B. latifolia* is a native of Brazil, and was brought from that country in 1840. Another good species, also in bloom now, is *B. eximia*. Its habit is like that of *B. latifolia*, but the leaves are different, being dark green and oblong-lanceolate, and the flowers are of a deep purple color. This plant also came from Brazil, but was introduced a few years later than the first-named species. When the blooming season is past, the plants should be potted, using a light, rich compost, and they should be grown in a strong moist heat. The Brunfelsias are propagated from cuttings, which root easily if placed in sand with good bottom-heat. The small young plants flower freely as well as the large ones.

The genus *Grevillea* contains plants which bear handsome flowers as well as decorative foliage. Perhaps the most desirable species grown for its flowers is *G. Thelmanniana*, also known in gardens under the specific name *Preissii*. A good specimen, four feet high and a yard across, is almost a constant bloomer here, but at this season it produces its flowers in greatest profusion. It is an erect, much-branched shrub, and the branchlets have a graceful drooping habit. Its leaves are pinnate, and the singularly shaped flowers are bright deep red, and yellow at the tip, borne in dense pendulous racemes three to four inches long. It is a south-west Australian plant, and grows well in a temperature ranging from forty-five to fifty degrees. When it requires potting, this should be done after the flowering season. The pot should be well filled with roots before the plants are shifted into a larger size, and they should not be given too large a shift, since the plant does best in a moderate quantity of soil, when it is less liable to suffer from overwatering. During the summer the plants should be plunged outside in a shady place and taken back to the greenhouse before frost in the fall. Half-ripened wood makes good cuttings, and these root easily in the bench with a little bottom-heat. When the plants are young they require frequent pinching, so as to make them close and bushy.

Botanic Garden, Harvard University.

Robert Cameron.

Damping Off.—At this season there is a great deal of this trouble among seedlings of all kinds, caused by various kinds of fungi. Where small quantities of choice seeds are grown in variety the seeds of each kind are generally planted separately in small pots or boxes, and it is, therefore, much easier to treat them than it would be to deal with a large quantity of seed in a bed or bench. In any case, the soil must be kept as dry as possible, without hindering the process of germination and growth, until the seedlings have made two or three rough leaves. Then they may be safely transplanted, although much watchfulness is still necessary. Where the soil is used in small parcels it may be sterilized in a hot-air oven. This process will destroy the germs of fungi. Sulphur may be mixed with the soil, using one part to thirty parts of soil. Powdered charcoal is also helpful when mixed with soil in the ratio of one to ten. As all propagators well know, this damping off is not confined to seedlings, but also attacks cuttings. It is for this reason that we prefer to use coarse, sharp, clean sand in our propagating-benches, the material least favorable to the growth or retention of noxious germs. But even sand becomes corrupt from long-continued use, and should be washed and sterilized occasionally.

Cornell University.

Michael Barker.

Strobilanthes isophyllus and *S. anisophyllus* are both good plants, and are blooming very freely just now. If they receive anything like favorable treatment they will bloom for two or three months. They are dwarf and bushy, with very dark green leaves, and carry a great profusion of lavender mauve-colored flowers. Young plants are very easily raised from cuttings, and during summer they should be planted out in the

garden, and taken up and housed in the fall when there is danger of frost.

Peristrophe speciosa.—This old favorite is very easy to grow, and brightens up the warm greenhouse during the dullest part of winter. It makes a thick, bushy, but somewhat upright, plant, and its bright purple blossoms are very attractive. Its flowers are not good for cutting, but a group of the plants serves to make a fine display at this time.

Robert Cameron.

Correspondence.

California Orange Groves.

To the Editor of GARDEN AND FOREST:

Sir,—The January freeze in Florida, which so severely injured the Orange-trees, has shown that orange-growing in that state is a precarious business. It is, perhaps, not generally known, but is none the less true, that the orange growers of California are exposed to the same risks that have this year resulted so disastrously to their Florida rivals. During the past four years many oranges have been frozen in southern California, in some sections from twenty to sixty per cent. of the crop having been lost each season. Every year the thermometer has hovered, for a few hours, on a few nights, at a point below the freezing-mark. A temperature of twenty-four degrees above zero for three or four hours means death to the crop. Should it be a few degrees lower, the trees as well as the fruit would be injured. This is a contingency that hangs over the grower every year, and adds greatly to the hazards of the business.

In addition to the danger of frost, the California grower must contend with high freight charges, on account of his distance from market, and with the constantly increasing competition of his own neighbors and of growers in other localities, such as Arizona, where the industry is yet undeveloped, but which may possibly become an active rival in the future. For several years he also ran the risk of robbery by dishonest middlemen. This last risk has been reduced to a minimum by the formation of fruit exchanges, which sell all the fruit of certain localities, ship only to known dealers, and demand a certain stated price, delivered on the train, before the oranges are forwarded. Furthermore, the California grower must make a market for his fruit in the large cities of the east. The taste of consumers must be educated to appreciate the California Navel orange, since most people prefer the sweeter Indian River orange. But California experts claim that connoisseurs and gourmets appreciate more highly the subacid, nutty flavor of the Washington Navel, and that they reject the Florida oranges as too sweet, and, therefore, insipid. If this assertion is true, it is also true that the tastes of the multitude have not yet been highly educated. This is partly the fault of an injudicious handling of the product. Just as California wines are adulterated and initiated to the detriment of the genuine, so the sale of the genuine California Navel orange has been hindered by dishonest growers and dealers, who have shipped unripe, inferior fruit, and sold it as the best. This year, owing to the unexpected demand following the Florida freeze, not a little of this fruit was sent to market before it was at its prime. An additional reason for haste was the fear of a freeze in California.

The estimated crop in California is two and a half million boxes, about half the amount of the Florida crop, had there been no frost in that state. At the start the net price to the grower, for the best Navels, was two dollars a box. California growers anticipate that the frost in Florida will check orange-growing in that state for several years to come and so give their own product a better chance than heretofore to gain favor in eastern markets.

Very few new Orange orchards are being planted in California, as compared with the plantings of former years, but the price of the best orange land has not been materially reduced. The best orchards now in bearing cost their owners fully one thousand dollars an acre before returns are received from the investment. Except in isolated instances, good orchards are not being sold, unless at figures based upon that cost to the holders. Tourists who have expected to secure bargains on account of the general depression in business have, as a rule, been disappointed. The conditions of the present year, unless the California fruit should also be frozen, will encourage owners to maintain fancy prices.

It is an open question whether these orchards are worth fancy prices. Their owners no longer hold out to intending buyers the profuse promises of boom days, but claim only that these orchards will pay a good return for labor and for the

capital invested. A moderate estimate of an average yield from a good, well-cared-for, mature orchard of Washington Navels is three boxes to the tree, or from two hundred and forty to two hundred and seventy boxes to the acre. This would seem to offer satisfactory returns, even at one dollar a box, net. But, on the other hand, taxes, labor and freight rates are all high. In some places the water-supply is uncertain, and the orange-growing communities, like all communities which depend for prosperity upon one resource, are liable to complete ruin from a single cause. This danger may be remote, but its existence, however remote, is a constant menace. Such ruin was formerly threatened the Orange groves by their parasite pests. These have been largely subdued, although the scale insects, particularly the red scale, are still troublesome. There remains that insidious enemy, frost, against which no vigilance can guard, and which is as voracious as fire. Although no frost has yet been severe enough to injure the trees in California, it is not impossible that Florida's experience this year may be that of California next year. Altogether, an Orange grove seems to be very like a mine—an excellent thing when producing, but liable to a disappointing pinching of the vein.

Wm. F. Tisdale.

Redlands, Calif.

A Venturesome Hepatica.

To the Editor of GARDEN AND FOREST:

Sir,—Several years ago I began to carry home with me from walks in fields and woodlands the roots of wild plants and set them in a suitable part of the garden. Many of these are still thriving, though some, like the Trailing Arbutus and Fringed Gentian, have resented the change and died out. Foam-flowers, Tiarella, from the Catskills, are well established here, and Harebells from the Adirondacks, Cardinal Flowers from Long Island, Blood-root from Staten Island, and a wide range of wild flowers from other near-by places. Besides the flowers provided in season, these wild plants afford occasional surprises, as when on the 26th of December last I found under a winter covering of leaves in a clump of Hepaticas, brought from Staten Island seven years ago, a sturdy flower which did not seem to know that it was braving the cold of the shortest days of the year. A few days before a Blood-root ventured to unfold its white petals, and on January 11th of this year, when for a few hours spring seemed in the air, two more Hepatica flowers ventured out. There were buds which promised to open soon, and, no doubt, they are awaiting the melting of the snow and will expand with the first genial weather. The place where these flowers appeared is sheltered from the west winds and from the east, but fully exposed to the north and south. Shall we call them belated autumn flowers or precocious harbingers of spring?

Bayonne, N.J.

H. J. S.

A Search for Gold Thread.

To the Editor of GARDEN AND FOREST:

Sir,—It is now almost a year since inquiries in a local newspaper as to where several plants, among them Gold Thread, Coptis trifolia, and Wild Ginger might be found, led to the formation of a society bearing the rather ambitious title of the "Natural Science Association of Harrisburg." Although the society numbers among its members an ornithologist of distinction, and several amateur students of entomology and geology, its chief interest has been from the beginning botanical. The club meetings are held once a month, when plants are brought in for examination and exchange, or papers are read and discussed. When the weather permits, weekly walks are taken to or from points within a ten-mile radius of Harrisburg. These walks, or explorations rather, as they are generally across country, some of it very rough, are a revelation to many of the members of the inexhaustible supply of subjects for investigation close to a city.

Out of a population of fifty thousand people, it is doubtful if a hundred know of the existence of the Iris meadows on the Conodoguinet; of the Rose Mallows in the swamp running from Harrisburg to the foothills of the North Mountain, five miles distant; of the Hepatica-covered bluffs on the eastern side of the swamp, or of the great belt of Red-bud that lies at the edge of the woods on the mountain itself. Gold Thread is yet to be found, but we know now where to look for Wild Ginger in the ravines of the York hills, the blue bells of the Mertensia Virginica in the meadows at their base, and the one meadow lying in a fold of the hills where Castilleja coccinea is found.

Another plant, so far found in only one place, is Lithospermum canescens, on a limestone bluff overhanging the Swatara Creek. Quantities of herbaceous plants have been located

and the time of their flowering noted as a guide for the future; among these are the great beds of *Trillium grandiflorum* on the Second Mountain. In Franklin County, a search for Gold Thread in the Rhododendron swamps of the South Mountain revealed *Dalibarda repens* and *Waldesteinia fragarioides*. In the same swamps are found *Magnolia glauca*, Sweet Magnolia it is called there, and quantities of fragrant Azalea, *R. viscosum*, also var. *glaucum*, but thus far no Gold Thread. The meadows of that county show quantities of *Gerardia tenuifolia*, and in one meadow *Pycnanthemum linifolium* and *Poterium Canadense* were found. The finding of *Magnolia glauca* was of special interest, since Professor Porter assigns its western limit in Pennsylvania to a ridge of the South Mountain, in Lebanon County, or quite seventy miles farther to the east.

All the South Mountain plants were located at an elevation of about one thousand feet, but as none of these last mentioned have been found near Harrisburg, it is a question whether the cultivation of limestone soils destroys many of our most beautiful wild flowers, or whether, like the Rhododendron, many of them are never found in limestone soils.

Harrisburg, Pa.

M. L. D.

Meetings of Societies.

Western New York Horticultural Society.—IV.

THE brief notes which follow conclude our report of the late annual meeting of this society:

INSECTS INJURIOUS TO FRUITS.

Professor M. V. Slingerland referred to the introduction of the San José scale, and then of the similar Plum scale, which has done much damage in some fine orchards in western New York. These remain on the tree all the year as hard, brown, conspicuous scales, easily found, and appearing like hard brown peas, which leave white spots under them when removed. The eggs are laid under the scales about the last of May, the scales usually being on the under side of the branches of the last two years' growth. The only alarming appearances have been, so far, confined to Geneva, Rochester and Lockport, but they caused considerable damage. The indications are, the young scales on the trees, which may be found in July, the old cases on the trees, and the presence of large quantities of honey-dew and its black fungus, as in the case of the Pear-tree psylla. The young scales pump out the sap and thus stunt the growth. There is a similar insect on Quinces, Apples and Elms. The Japanese Plums do not seem yet to have been attacked. In August the young scales place themselves and never move again. The next May egg-laying begins about the middle of May and continues till the hard case is nearly full, each mother laying about a thousand eggs. The eggs begin to hatch about the first of July, and the young then begin to crawl to the leaves, where they place themselves near the veins, preferably on the under side. The scales, now five millimeters long, cannot readily be distinguished without a lens. About the last of August they migrate to the under sides of the smaller branches, where they pile up often two or three layers deep. They are brown in August and seal-brown later. About ten per cent. fall with the leaves. The scales are now about twice as large as when hatched. The next spring they are full-grown. If left to themselves they would move slowly, but in their migrations they may get on birds, insects and leaves and be thus transferred. There is little danger of infection from nursery stock, as the scales have not been found on trees under five years old. The scale has two enemies—one a lady-beetle that eats it, and a parasitic insect. The scale must be killed by contact. The kerosene emulsion of a strength of one to four will kill the greater part of them. Between May and October there is but one week in which to operate with any chance of success, and that is about the first of July, when the insects are moving on the limbs. It is impracticable to kill them on the leaves, except by gas treatment, and this is too expensive. In the autumn, after the leaves fall, the emulsion diluted to a strength of one to four should be used and the tree drenched with it. The dead scales are a bright brown, hard to distinguish from the living ones. Most of the scales are on the under side of the branch and in crevices of the bark. If sprayed in the fall, again some time in the winter, and in March twice, the cost will be about three cents a tree for a thorough application.

PEAR BLIGHT.

In an illustrated lecture on this subject, Professor Waite showed that the flowers could be infected artificially, the nec-

tary being the only part of the tree that can be successfully infected without puncturing. It was shown, experimentally, that insects carry the germs in their rounds from flower to flower and thus inoculate the blossoms. Trees overstimulated, especially with nitrogen, seem to take the blight most readily. The blight works downward, and the point it has reached at any time is clearly defined. If the diseased parts are removed the roots recover. In cutting off blighted portions in the dormant season it is only necessary to cut just below the blight. In the growing season the branch must be cut a considerable distance below, and in both cases it is advisable to burn the parts.

The germ usually enters the tips next the blossoms, and advances towards the trunk. Three weeks after the twigs die the germs usually all die. The germs have never yet been found in the soil, but they have been found to live over in affected parts next to the living tissues. They will sometimes live through Bordeaux mixture. If the weather could be controlled, then pear-blight could be, as moist, muggy weather favors it. Bartlett is one of the worst varieties to blight, and so is Clapp's Favorite. All Pear-trees, whether dwarf or standard, should be headed in as a preventive measure. Nitrogenous manures should be used sparingly, and blight-proof varieties, such as Angoulême, Keiffer and Lawrence, should be preferred.

Mr. Beach said there had been some injury this year from spraying with the Bordeaux mixture. If the copper sulphate is diluted, or partially diluted, before adding the lime, and the whole is then well stirred before adding the ferrocyanide there will be no trouble if no brown color appears. Free copper is often the cause of injury. The extra irritation of the cold damp weather makes the roughness on so many varieties, Western Beauty and Ben Davis among others. Apples that have been sprayed, even in a wet season, keep better than others. He also said that lime was fresh-slaked if it had been kept under water constantly after it was first slaked and not allowed to dry. He cautioned users of the Bordeaux mixture to turn the nozzle back in the barrel after every stop of even a minute, as the ingredients settle immediately, so that the first application will otherwise be too strong.

Mr. Woodward spoke encouragingly of nut-culture. He had Paragon and Numbo Chestnuts six years old that have borne three years. He took cions in 1893, and top-grafted on native trees, and had fruit in 1894. Paragon is four times as large as our common chestnut. It is a native seedling of a foreign variety. Numbo is larger than Paragon, but not so sweet. He whip-grafted, cleft-grafted and slipped cions under slit bark. His greatest trouble is in having the cions broken off by wind after they begin to grow.

Among the new diseases reported are the Peach-scab and the powdery mildew of the Peach. In Niagara County, Bordeaux mixture injured the foliage, but did not check the trouble. Ammoniacal carbonate of copper also hurt the foliage, with but slight results in checking the disease. In Tompkins County there was a new Raspberry disease, in which the fruit dries on the bushes, the stems are brittle and break like pipe-stems.

Mr. Hooker said he had three to five hundred trees, fifteen years old, killed outright by the scales. In his neighborhood they had been found on Hickory, Elm, Orange, Quince and Honey Locust. The German Prunes are not exempt, but the Lombard and Reine Claude were the worst affected.

Notes.

In our notes on new plants last week it should have been stated that all the hybrid Cypripediums named were raised at the United States Nurseries of Messrs. Pitcher & Manda, at Short Hills, New Jersey.

Dr. Hoskins says that the Green Mountain grape ripens in northern Vermont thoroughly every year, and in thrift, productiveness and quality is proving all that could be desired as a family grape; and he adds that there is only one other grape of good dessert quality which he has found early enough for this region. Is this the Diamond?

One of the most famous trees in Germany, the so-called Cathedral Linden of Brunswick, fell and perished a few months since. It must have been large enough to be popularly noted five centuries ago, for in a pamphlet published in the year when America was discovered may be read the statement that, in 1473, the summer had come so early that "the Lime-tree of Brunswick" was in leaf on Easter Day.

We have received from Messrs. Siebrecht & Wadley several flowers of the Rose Belle Siebrecht, which has already been described in these columns. We only need to add that careful observation of these flowers proves the truth of what has been claimed as to their lasting qualities and as to the singular purity of their color under artificial light.

Experiments at the station in Kingston, Rhode Island, confirm former tests and show conclusively that air-slacked lime tends to increase the disease known as the scab of potatoes. The natural acidity of soils tends to diminish the disease, and the reason why barnyard-manure aggravates it is attributed to its alkaline action in overcoming the souring of the soil. Barnyard-manure, where stock is fed on uncooked potatoes or beets which have the disease, may carry the germs to the soil and increase the disease.

A correspondent of the *Baltimore Cactus Journal* advises that when Cacti are repotted, the most suitable time for this being February or March, the soil used should neither be damp nor dust-dry, but it is best to err on the dry side. When turned out of their pots most of the soil should be shaken from the roots of the plants, and the roots should be well spread out when they are shifted, and good drainage should certainly be secured. A handful of sand put directly under the plant is in all cases beneficial.

At this time of the year branches of spring-flowering shrubs and trees, when placed in water, readily open their buds, and in one of the up-town flower-stores, where a specialty is made of this kind of decoration, among the plants treated in this way were Crab-apple, Japan Quince and Forsythia. Flowering sprays of different species of Acacia, Chorozema and Jessamine are also occasionally seen, and among potted shrubs in bloom now are Cytisus, Azaleas, Ericas and double-flowering Almonds. Among the commonest herbaceous potted plants in flower and on sale are Cinerarias, Pansies, Primulas and Cyclamens. Cut flowers of white camellias, which have been practically banished for a long time from the markets, seem to be slowly gaining a foothold. Of course, there are quantities of hyacinths, tulips and daffodils, with poet's narcissus, which seem to be popular for button-hole bouquets. Cattleyas are very abundant, and retail readily at fifty cents each.

Unless Strawberry-plants are shipped very early in the season, there is much danger that they will heat in transit. This is especially true when they carry a considerable quantity of heavy green foliage, which has probably been warmed up in the middle of the day before the plants are packed, and packed closely, as is often necessary. Mr. J. H. Hale writes to the *Florists' Exchange* that specialists in Strawberry-plants put on large numbers of men to dig them early in the morning, and carry them at once into cool cellars, where they are trimmed and packed. But even where no digging is done in the middle of the day, unless they are very carefully handled, the plants are in danger, and, therefore, an experiment now in progress in Delaware will be watched with interest. A nursery firm there has built a cold-storage house, in which all the Strawberry-plants are put as fast as they are packed, and cooled through before they are delivered to the transportation companies. The expectation is that with this treatment there will be no trouble from the heating of the plants.

Mr. John N. May writes to the *American Florist* that because Roses are coarse and gross feeders many persons make a mistake in giving them, when grown under glass, too much, or, at least, too strong liquid-fertilizer. It is never safe to use more than half a pound of nitrate of soda, for example, to fifty gallons of water, and an application of this once in twenty-five days is often enough. Old plants, which have been growing two or three years in the same soil until it is a mass of roots, will take liquid-manures oftener, especially when the days are getting longer, the sun brighter and the vital forces of the plant more active. The safest method, however, is to feed lightly; that is, to make the liquid fifty per cent. weaker than is usually considered the proper proportion, and when the plants are in proper condition for being watered to give them a good soaking with this diluted food. The roots can then take it up at once and the plants will feel the effect immediately. Liquid-manures of all kinds should be used with great discretion, and Mr. May never applies any liquid which is so much discolored that he cannot see through it.

Small quantities of lettuce which have escaped the frost in Florida are now in market, but, except that which is grown under glass, most of it now here comes from Bermuda. A few new potatoes are also coming from Florida, but the supplies of fresh vegetables from our southern seaboard has practi-

cally stopped for the present. Such hardy plants as Strawberries will, no doubt, put out new blossoms and bear a crop of fruit later on, but there never has been in this country so great a destruction of garden crops by frost as that caused by the recent cold weather in our southern states. All the string beans we have are now coming from Bermuda, and Havana is sending us tomatoes, peppers, okra, eggplants and onions. It has been a rich harvest for those who have grown vegetables under glass. The market has readily taken at good prices all that has been offered. Long, slender green shoots of forced asparagus sell for \$1.50 a bunch of a dozen stalks. Cucumbers bring twenty cents each, lettuce fifteen cents a head, new carrots ten cents a bunch, ordinary red tomatoes seventy-five cents a pound, and a fancy yellow variety which comes in small quantities from Hackensack commands \$1.00 a pound.

A bulletin just issued from the United States Department of Agriculture gives a concise description and history of the Peanut, together with notes on its cultivation and uses. As is well known, this is not really a nut, but, more properly, a ground pea. Analysis gives the peanut a high rank as to its food value, since it contains twenty-nine per cent. of protein and forty-nine per cent. of fat, and it should be classed with such concentrated foods as the soja-bean and cotton-seed, while the vines are superior to Timothy hay as feeding stuff, and, of course, would be equal, or superior, to Clover hay if any considerable percentage of nuts were left on the vines. The average yield of peanuts in Virginia is about twenty bushels to the acre, and, in Tennessee, thirty-two bushels, but fifty to sixty bushels ought to be an average crop, and one hundred bushels not an uncommon yield. Fair Peanut-land, when properly treated, should produce fifty bushels to the acre, with one or two tons of excellent hay, in ordinary seasons. Four million bushels are annually raised in this country, which is only about one-seventh of the crop of the world. Millions of bushels are used in the Old World for the production of oil, in which these nuts are very rich.

No more beautiful flower grows in New England than the Sabbatia, and at Plymouth, where it is especially profuse and luxuriant on the borders of the ponds so characteristic of that part of eastern Massachusetts, it is held in peculiar affection, and, one may almost say, reverence. It is locally called "the Rose of Plymouth," and during its brief season of bloom is sold in quantities in the streets of the town and used in the adornment of houses and churches. Its name comes from that of an early Italian botanist, Liberatus Sabbatia; but this well-established truth is totally disregarded by local tradition. Almost every one in Plymouth firmly believes that the title is due to the fact that the Pilgrims of 1620 first saw the flower on a Sabbath-day, and, entranced by its masses of pinkish lilac-color, named it for the holy day. Indeed, this belief is so deeply ingrained in the Plymouth mind that, we are told, strong objections are made if any other flowers are irreverently mingled with it in church decoration. Yet the legend was invented not more than twenty-five years ago by a man whose identity is still well remembered; and thus it is of even more recent origin than the one, still more universally credited, which says that the Pilgrim Fathers landed upon Plymouth Rock.

Large areas of Pine-lands in lower Michigan, from which the timber has been cut, have passed back to the control of the state on account of the non-payment of taxes. The purchasers have thought that this sandy soil, especially where it has been burned over, will not produce a second growth of Pine for a long time, and it is, therefore, abandoned as a perpetual wilderness of deciduous coppice-wood, valueless for timber. The editor of the *Northwestern Lumberman* quotes the opinion of Mr. Carey, special agent of the Forestry Division of the Department of Agriculture, who has been making investigations throughout the state, and he has arrived at the conclusion that this land can again produce as fine a growth of White and Red Pine as ever grew on this continent. All that is necessary, he says, is to keep out fires, browsing sheep and cattle, and in forty years the second growth of Pine will make profitable cuttings, as it has done in Maine, New Hampshire and other parts of New England. It will be a fortunate thing for Michigan if this hopeful view proves correct. In any case, it is worth while for the state to take these lands in hand, and begin at once not only to pass laws for protecting their young timber-growth, but to enforce these laws with vigor. We should expect to find that lands which have been burned over and over again have lost much of their original timber-producing power. But this is a good reason for husbanding all the fertility that remains.

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLE: —The Defacement of Scenery.....	81
The Care of Urban Parks.....	William MacMillan. 81
The Chestnut in the West.....	Professor Charles A. Keffer. 82
PLANT NOTES: — <i>Spiraea Thunbergii</i> . (With figures.).....	83
CULTURAL DEPARTMENT: —A Few New Garden Plants.....	J. N. Gerard. 85
<i>Angraecum sesquipedale</i>	Robert Cameron. 86
<i>Amaryllis</i>	W. Tricker. 86
<i>Eucharis Amazonica</i>	W. N. Craig. 86
Violet Notes.....	E. O. Orpet. 87
<i>Chrysanthemums</i>	T. D. H. 87
Grapes under Glass.....	William Scott. 87
CORRESPONDENCE: —Inscriptions on Public Monuments.....	M. G. Van Rensselaer. 87
The Effect of Bad Seasons on the Growth of Trees.....	Austin Cary. 88
MEETINGS OF SOCIETIES: —National Carnation Society.....	89
NOTES	89
ILLUSTRATIONS: —A Flowering Branch of <i>Spiraea Thunbergii</i> , Fig. 11.....	84
<i>Spiraea Thunbergii</i> , Fig. 12.....	85

The Defacement of Scenery.

ABOUT a month ago a bill was introduced into the Massachusetts House of Representatives entitled "An Act to prevent the offensive use of buildings for advertising purposes." This act makes it unlawful to paint on any house, barn or other building any advertisement of a patent medicine or other commodity in letters or characters which are more than six inches long and four inches wide, and the violation of this statute is to be punished by a fine not to exceed \$500. We hardly understand why obtrusive vulgarity of this sort is more offensive when it is painted on a shed or a mill than when it is displayed on the spacious and ugly board structures which are usually braced up in the most conspicuous parts of the landscape. And certainly natural objects need some protection against this vandalism, for every one has had his feelings outraged when he has seen in different parts of the country rocks and cliffs covered over with highly colored importunities to use one man's ready-made soup or to try another man's remedy for indigestion. Two or three years ago the newspapers were filled with protests because the face of Storm King, on the Hudson, had been desecrated by such an advertisement, and the correspondence on this subject brought out the fact, which did not seem to be generally known, that laws in New York state already existed which made such wanton defacement of scenery a misdemeanor to be punished by fine or imprisonment. The prosecutions under these laws have certainly been very few, and no one has ever been sent to prison for violating them.

Americans are not the only sinners in this respect. It will be remembered that no longer ago than last year the Prime Minister of Great Britain spoke bitterly of the way in which the beauty of the rural and seaside scenery of England was disfigured by this advertising plague. Lord Rosebery said that the people had become so used to seeing the picturesque and historic beauty of the old towns marred by the paint-pot that they had ceased to utter any protest, but now when the advertiser had covered over all the station walls and gable-ends of town buildings, and was spreading himself over the woods and fields of the country, it was time that steps should be taken by Parliament to put a stop to the destruction. But acts of Parlia-

ment will do little more good in England than will laws in the state of New York or in Massachusetts, unless there is a public opinion behind them which secures their enforcement. Within the limits of this city, and on lands controlled by the Park Department, massive rocks which constitute the chief beauty of the property have been hopelessly disfigured, and yet no action was ever taken against the offender, although the department had ample power to bring him to punishment. No protest against this defacement was made, so far as we remember, by the press of the city, nor was the department criticised for neglecting to prevent it.

This injury to natural beauty will go on just so long as it is not a generally appreciated truth that natural beauty is to a certain extent an inheritance of all the people, that it has a real value like pure air and fresh water, and that the man who destroys it, therefore, violates as distinctly the rights of the public as one does who fills the air with noxious vapors or pollutes the sources of public water supply. Great corporations who build railroads, sink oil wells and open mines and quarries never inquire about the wounds they inflict on the face of nature, and no one protests against the desolation which they make, partly because we consider this one of the sacrifices we are called to make on the altar of material progress, and partly because few people recognize the fact that landscape beauty is anything like a vital necessity to the mental and spiritual health of a people.

The plain truth is, that natural beauty has an intrinsic value as a refreshment to the spirit, and a restorer of the health of mind and body. It is practically and actually effective in making such appeal to the imagination that as we contemplate it we are elevated for the time above the wear and weariness of every-day life into an atmosphere of restoration and repose—into a realm of higher and serener thoughts which bring health to the body through their tranquilizing influence on the spirit. In short, the contact with natural beauty is one of the potent agencies for establishing sound minds in sound bodies; and since this is the source and condition of all well-directed ambition and effort, a reckless destruction of this beauty is a blow not only at one of the highest and most satisfying pleasures of the people, but at the public health and the public wealth.

This is not a merely sentimental or fanciful view of the case. It is fundamental truth. When Lowell writes that "the landscape, forever consoling and kind, pours her wine and her oil on the smarts of the mind," when Wordsworth asserts that the presence of nature "disturbs him with the joy of elevated thoughts," and whenever, in the highest poetry, the elementary and controlling feelings of the soul find expression, this profound truth is recognized. No enlightened man disputes it. Why, then, should it not be accepted as sound doctrine that it is one of the inalienable rights of man to enjoy the unimpaired beauty of the world into which he has been born, and that it is the duty of society which has inherited this beauty to transmit it unimpaired to posterity? We may be assured in the first place that this is no transient sentiment which will pass out of fashion. The imagery of the Old Testament and the earliest poetry of the world prove that these same emotions swayed the races who laid the foundations of our modern civilization. Susceptibility to the influence of natural beauty is one of the original and essential qualities of the human mind, and it is never likely to be outgrown. Indeed, we may be sure that the beauty of the outward world which is preserved for posterity will be more highly appreciated by them than it is by us, for this feeling has grown in depth and strength with the growth of the race, and it will probably continue to grow.

Taking this view of the case, statutes leveled against the irreverent use of paint in the landscape seem to be an altogether inadequate expression of what ought to be the prevailing thought and habit among cultivated people. It is to be hoped, of course, that the Massachusetts Legislature

will enact this law, and that other states will enact similar and more stringent ones, but after all, as has been stated before, we not only need a public sentiment, but a public conscience in this respect, which will do more than merely resent the wanton defacement of natural beauty—which will take pains to preserve and develop by reverent treatment scenery which inspires noble thoughts by its sublimity or soothes and refreshes the mind by its beauty. Societies for the protection of such scenery have been established in many European countries, and certainly it is high time that some organization of this kind was formed here. The very existence of such an organization, not to speak of the influence of its publications and of its active efforts at prosecuting offenders, would arouse people to know their rights and to assert them. A few intelligent men are now making protest against stripping the forests from our mountain-tops because this impairs the natural and needed supplies of timber and of water. Why not also protest that the destruction of the woods mars the beauty of the landscape which is our common inheritance? When this subject is properly brought home to the intelligence and moral sense of the people the reckless destruction of natural beauty will not only be held a misdemeanor in law, but it will be considered a gross outrage against common decency, and the man or corporation who heedlessly and needlessly defaces the beauty of the world will be considered a public enemy.

The Care of Urban Parks.

AT one of the meetings of the World's Fair Horticultural Congress in Chicago, Mr. William MacMillan, Superintendent of Parks in Buffalo, New York, read a paper on the improvement and care of public grounds, the concluding paragraphs of which are here reproduced:

In every public ground there should be a due proportion of smooth lawn or open green. There is a special beauty in a broad stretch of fresh-hued greensward, made to be looked at and not trod upon. Park visitors in general think they can "eat their cake and have it too"—enjoy the beauty of a finely kept lawn and yet daily trample the sod. All restrictions are resented, and each green lawn is coveted for games of some sort, to an extent incompatible with its preservation. Where the turf has any shade it is wanted as a "picnic common," with the same result. Margins of walks are obliterated in like manner, and beaten footways trod out wherever any short cut can be found. There is no feature of a park so popular as a short cross-cut, especially if the practice is known to be a trespass. The license first overlooked because no damage is yet apparent, then openly allowed because the usage is so common, soon spreads to like abuses of the shrubbery and younger trees, with results still more destructive. In all large grounds suitable sections are especially prepared for playgrounds and commons, but it is essential that the spaces reserved for smooth lawn and ornamental planting should not be overrun.

Because, as a rule, the damage done by each trespasser is in itself scarcely perceptible, few realize the great destruction, both to greensward and shrubbery, which results from the constant repetition, day after day, of petty trespasses, each in itself insignificant. The worst of it is that as soon as at any point some special line of trespass begins to leave a clear mark behind it, the evidence of the damage done, instead of restraining others, seems rather to tempt every passer-by to repeat the offense. In proportion as the tasteful and ornamental character of the grounds disappears there seems always, of course, the less reason why regard should be given to any stray remnants of the original habit in which it is dressed. Park police are powerless to stop such usages once they get headway. Only those persons can be checked who can appreciate the necessity of strict regulations. Arrest and trial are useless, as the punishment inflicted, if any, is never sufficient to warn others, or even to prevent a repetition of the same offense.

Thus, instead of the neat and trim aspect which a pleasure-ground should exhibit, it assumes a neglected, slovenly appearance, very unsightly to every person who has any regard for the tasteful embellishment of public grounds. Much of the pleasure is lost which would be enjoyed if the grounds were carefully kept and orderly behavior everywhere enforced. The value of the grounds is utterly lost to those visitors who may wish to gratify a refined taste for the beautiful in nature.

Apart from loss of character and reputation, the loss involved in the cost of annual repairs, or by permanent destruction of property, is also an important item.

The care and satisfactory management and maintenance of public grounds is a more difficult work than their construction. The general design of the improvement may be clearly imprinted on the grounds, the controlling motive may be apparent, the beauty beginning to develop be appreciated, and it becomes a popular resort for the recreation it was intended to provide. But many misunderstand its function, take little interest in the natural beauty of the landscape, look upon drives, rides and walks as more important features than the scenery in which they are set, see in the open greens only an opportunity for athletic games, in the woods only a resort for the usual picnic sports, and in the waters only facilities for rowing, sailing or skating, according to the season. So demands are soon made that permission be given to each class to indulge in the outdoor pastimes in which each is especially interested for the time being. Owners of fast horses want a speedway for racing sports, equestrians want the open stretches of turf for galloping on, hurdles to be set up for them to jump over, and a special section reserved for polo playing; bicycle riders want special tracks for greater convenience and for competitions of speed, and visitors on foot want the license of going anywhere at will and doing as they please.

Others spy out a chance to advance some personal scheme of private advantage under the cloak of concern for the public good. Space is wanted for a merry-go-round for the amusement of the children. Some sharp slope is just the right pitch for a toboggan-slide or a coasting-rink. An amphitheatre-like sweep of bank is coveted for spectacular exhibitions, circuses, shooting-matches, etc., with all their paraphernalia of tents and enclosures. The smaller greens must be devoted to tennis and croquet, the larger to baseball and lacrosse, and the largest to military maneuvers and mass-meetings. Thus at every point usages creep in which are in many respects inconsistent with the conservation of natural beauty of the grounds, and in the end utterly destructive of its most attractive features.

Similar damages arise from other causes. The owners or occupiers of the land adjacent to the park boundary become dissatisfied with their position at the back of the picture. They think it would be much improved (to them, at least) if the frame were knocked off. The effect to the public at large, who look at it only in front, is to them a matter of no consequence. So new gateways are urged wherever any plausible plea can be offered for them; openings in the border screen are wanted opposite this man's bay-window or that man's vacant lot, to improve the private view or to help the sale of the property. These schemes succeeding more or less, a combined raid is next made on the boundary fence, because "it is unsightly, it is useless, it is a relic of barbarism, a sign of aristocratic exclusiveness," and so forth. The grounds belong to the public, and they should not even seem to be shut out from their own. If removed, they may be trusted not to abuse the confidence reposed in them. The temptation to trespass would be resisted, and the proper gateways only would be used for entrance or exit just as before. The fence accordingly is removed, the boundary is immediately overrun in every direction, the regular walks are neglected, tracks are at once beaten out in the grass on all the direct lines of passage, and all semblance of order vanishes from the grounds along with the last vestiges of garden ornament and finish.

These usages are fatal to all artistic design, as shabby gentility is especially offensive to good taste. Their effects are more or less visible in all our public grounds, and most seriously deface what were originally the fairest portions. This has led to some reaction against any elaborate finish, and to a demand for simplicity to the extent of crudeness; all open grounds to be treated as commons, and all plantations as if they were natural woods. But the natural beauty of the simplest scenery is soon destroyed by such public usage. Therefore, whatever the style of improvement may be, it must be maintained intact after its kind, else all the money spent on it is worse than thrown away.

This is not meant to discredit the taste which selects for public grounds sites where pronounced natural features are the chief attraction, without any improvement, so-called, except what is necessary for convenient locomotion in public use. Examples of this class may be cited where their grandeur or picturesqueness make fine embellishment an intolerable intrusion. Such are the Wissahickon Glen, at Philadelphia; the gorge of the Genesee, at Rochester; East Rock and West Rock Crags, at New Haven; the Lynn Woods, at Lynn; Burnett Woods, at Cincinnati; the state reservations at Niagara and Minnehaha, and the several national reserves. The taste

which perceives the scenic value of such places and conserves them for public enjoyment, is a promising sign of the strength of public sentiment which in any community may be depended on to support all intelligent effort in the improvement of a public ground to conserve and develop its natural beauty.

The Chestnut in the West.

THE Chestnut has naturally a somewhat restricted range, its western limits being in the states of Michigan, Indiana and Tennessee. It illustrates, as do many other forest-trees, the fallacy of supposing that natural distribution is a reliable indication of possible range under cultivation, for the tree can be successfully grown throughout Missouri, the eastern counties of Kansas and Nebraska, and the southern half, at least, of Iowa. I know splendid trees in bearing at Des Moines and Kansas City, and there are thrifty specimens at Farlington and Manhattan, Kansas. What is even more surprising is that the tree can be seen at Fort Collins and Denver, Colorado, though, through lack of irrigation at the latter place, the thrifty little plot of them has been almost entirely destroyed.

The best Chestnut-trees that I know in the west are in the grounds of Mr. L. A. Goodman, at Westport, a suburb of Kansas City, where they occupy two rows in the orchard. The trees are twenty years old from the seed, were transplanted twice before being set in the orchard, and some of them are now forty-eight feet high, with a spread of branches of twenty-eight feet. There are twenty or more of them, and all are of good form and habit, and as healthy as any trees of this species wherever found. Mr. Goodman has grown them for their nuts, and, being an expert horticulturist, he has developed full crowns and comparatively short trunks, treating them essentially as he has the Apple and Cherry trees which make up the remainder of his orchard.

The Chestnuts at Farlington have been in close mixture with Wild Cherry, Black Walnut, a few Catalpas and Ailanthus, planted four feet apart each way. These were set as yearlings in 1882, and are now fifteen years old. They average twenty-eight feet high and about three inches in diameter, breast-high. The trunks are cleaning themselves well, and are free from live branches to a height of ten or fifteen feet. The close planting has undoubtedly retarded their growth, but it must be remembered that the Farlington trees have received practically no attention in twelve years. The trees in these two plantings fairly illustrate the difference in management for timber and for nuts, and this point cannot be too strongly emphasized. In growing any of the nut-trees—Hickory, Butternut, Pecan, Walnut or Chestnut—if timber is to be the crop, close planting, with a proper regard for light requirement, should be the method pursued. If the nuts are to be the crop, wide spacing, high cultivation, with proper attention to fertilizing the soil and pruning are necessary. In the one case we seek to get length of straight trunk at the expense of crown, and in the other we pay little attention to length of bole, and develop the crown to its fullest proportions.

A good many years ago, Mr. James Smith, the veteran horticulturist of Iowa, planted Chestnuts along his fence rows, and in the early eighties the small boys of Des Moines were surreptitiously enjoying the unique pleasure of opening chestnut burrs.

There is a single Chestnut-tree, fully eighteen inches in diameter at the ground, on the lawn at Professor Popenoe's, Manhattan, Kansas, and several small Chestnuts in the grounds of the Colorado Agricultural College, at Fort Collins, are doing well under irrigation. On the Everett place, near Denver, trees of this species attained a height of twenty feet, when they failed for lack of water. These were planted in a forest-tree nursery, which was afterward abandoned and the water withdrawn.

In growing Chestnuts it is best to plant the seed where the tree is to stand, but if transplanted at one and two years old they can be removed without especial difficulty. The

nuts should either be planted in the fall, or kept in a well-drained place in the open air, in layers a few inches thick, with a covering of leaves and boards. Fall planting is best.

Washington.

Charles A. Keffer.

Plant Notes.

Spiraea Thunbergii.

THIS Chinese shrub is not only one of the best of Spiræas, but one of the most useful of all hardy shrubs, from the fact that it is attractive from early April till late November. It bears flowers every year, which are small individually, but as they are produced in corymbs on the end of the lateral branches in great profusion they completely cover the shrub in early spring. A habit at once graceful and compact, with slender willow-like leaves of a bright, cheerful green, makes it an interesting plant all summer long. In the autumn it holds its foliage until nearly every other deciduous shrub is bare, and then it turns first to a deep bronze, and afterward to a brilliant orange or scarlet, or sometimes pink, colors which are so effective that the shrub is worth planting for its autumn tints alone. Some complaint is made that the lower portions of the stem of the *Spiraea Thunbergii* become naked and unsightly with age, but this is a fault with many shrubs and one readily overcome by pruning. Its only real drawback in this region is that the very tips of some of its branches are occasionally killed in severe winters, as will be seen in the picture of a flowering branch on page 84.

Mrs. R. Swain Gifford, who sends us some interesting notes on the behavior of this shrub in New Bedford, Massachusetts, says that "in landscape-gardening its delicate and graceful habit makes it one of the best foils for a sturdy and stiff growth. An artist painting a picture of a formal entrance to a garden where Hydrangeas and a stiff hedge of Hawthorn grew beside a stone wall chose a position where the light feathery branches of a *Spiraea Thunbergii* swept across the foreground. What is good for a picture must also be good for a garden arrangement." The illustration on p. 85 well shows its value in landscape composition. Mrs. Gifford also notices what we have never before seen stated, that this *Spiraea* is one of the very best of shrubs for planting near the sea. "I have a plant," she writes, "that has grown for several years so near the sea that it is subjected to all the rough usage of wind and storm. Although it appears delicate and fragile, it endures these hardships well, and when it becomes drenched with salt spray it loses none of its brightness, while the foliage of other shrubs and trees near it is blackened and unsightly."

Both the illustrations of this *Spiraea* are from photographs taken by Miss Edith Eliot, of New Bedford, Massachusetts.

VIOLA ODORATA, var. SCHÖNBURNN.—This is a perfectly hardy Violet, which succeeds well under almost any conditions. The growth is low, there are numerous runners, and the flowers are deep blue, small and very sweet. The most abundant bloom comes in early spring, the last of March, or in April, when well-grown plants are a perfect mass of blue. The flowers begin to appear in September, continuing until severe weather, and often during the winter even a few blooms can be picked, with short stems, to be sure, but none the less sweet-scented if they are grown in a sunny, sheltered place and have the advantage of a few mild days. The plants can be grown in masses in the herbaceous border, and these, with liberal treatment, will give the best results. They spread by runners and by self-sown seeds, which latter make the best plants; the only real care required is to foster the production of fresh plants, and even this is generally done by the natural seed propagation. This Violet is a fine plant for the wild garden; it does not dislike a partial shade, and does wonderfully well in grass, if the latter be not too well kept. A pretty effect can be obtained by planting beneath sunny windows, where the Violets will bloom with Crocus and Snowdrops,

and strengthen our realization of spring. A Violet, very much like the Schönbrunn, has lately been grown about Boston, introduced from Florida; it succeeds admirably for forcing in a cold frame; the flowers are larger, the stems longer and the habits of blooming more nearly perpetual. This Violet blooms profusely in the autumn up to the time of heavy frosts. It is sometimes called the Florida Violet, but is as yet little known; it is probably hardy.

VIOLA ODORATA, var. *LEES VICTORIA*.—This plant is old, but little known, and so much resembles the well-known Czar that it is almost impossible to distinguish between them. The flowers are single, deep blue, large, and borne well above the foliage; it is not sufficiently hardy to warrant its cultivation in the open air in this latitude, or at least in New England. Its habits of growth and the liberal manner in which it blooms, throwing a great quantity of flowers within a comparatively short time, makes it an impor-

young plants should be set out in early spring on a warm, sunny slope in well-drained soil; if the season is at all favorable there will be an abundance of bloom from September until severe frost. The propagation is by division; the stubby nature of the growth makes it best to treat the pieces as cuttings and plant them in sand.

LYCORIS SQUAMIGERA.—Under the more familiar names of *Amaryllis aurea* and *A. Hallii*, this plant has long been known in American gardens, chiefly from bulbs distributed by Messrs. Hovey, of Boston, sent them originally by Dr. George A. Hall from China. It has, however, always been a scarce plant owing to the fact that since its original introduction few bulbs have been imported. It is said that the plants have been cultivated for a long time at New Bedford, Massachusetts, from bulbs brought over by one of the old China traders resident there, and in the Manning Nurseries at Reading a mass of them have flowered beautifully every autumn for years. The bulbs here were planted at the base



Fig. 11.—A Flowering Branch of *Spiraea Thunbergii*.—See page 83.

tant plant, and more valuable than the Czar for most purposes. It is highly desirable for blooming in a cool greenhouse during winter, and much better suited for pot-culture than the more commonly grown double-flowered sorts. The treatment is the same that would be given to the hardy Primroses and Polyanthus. Establish the plants in five or six inch pots in early September, and for this purpose plants which have been starved in smaller pots during the summer are often better than the stronger specimens obtained by field-culture. Store them in a cold frame or dry pit; water sparingly, and do not encourage the fall bloom; bring them into a cool house in successional lots any time after the turn of the year. Kept near the glass they will give plenty of flowers for ten days or a fortnight, when they can be thrown away or preserved for blooming another season, the second or even third year's flowering being often very satisfactory. This Violet is also a free bloomer in the open air in autumn; for this purpose

of a south wall, where they have ripened well and proved perfectly hardy. We learn that recent importations by an English firm have made this fine hardy bulb more plentiful, and it is to be hoped that we can soon obtain it in quantity, for there is no doubt of its hardiness here, although it has proved tender at Kew, and is there cultivated in a cold frame. Probably the bulbs do not get fully matured there, for it is well known that many Japanese and Chinese plants withstand more cold here and thrive better than they do in English gardens. A description of *Lycoris squamigera*, with a figure, was published in *GARDEN AND FOREST*, vol. iii., page 176. There is also a colored figure of *L. aurea* in a recent issue of *The Garden*. This *Lycoris* will require about the same treatment as that given to *L. radiata*, or, as it is often called here, *Nerine Japonica*. In structure *Lycoris* is more nearly allied to *Nerine* than to *Amaryllis*, but is quite distinct from both, not only botanically, but horticulturally.

Cultural Department.

A Few New Garden Plants.

OF new plants the principal offerings are, as usual, the so-called florists' flowers, with a few greenhouse and stove plants. Of these it is not my intention to make notes, but only of a few new things, mostly border plants, which are likely to interest the amateur who is looking for flowers which are attractive, but which may or may not be useful according to florists' standards.

The hybrid Briers, originated by Lord Penzance, are to me the most attractive of the new offerings. These Roses have often been described in GARDEN AND FOREST; they were figured in *The Gardeners' Chronicle* in 1891, and were honored with a colored plate in *The Garden*, No. 1105. They were produced by crossing the Hybrid Perpetual Roses, Fortune's Yellow and others, on the Sweetbrier. The new Rose is said to be strong and vigorous, very sweet-scented, and the foliage retains all the charms of the Eglantine, being quite as fragrant.

free growth, this may make a valuable out-of-door plant if well treated.

The Hybrid Tea Rose, Belle Siebrecht, is a Rose of not so rare a color, though of a beautiful rosy pink and excellent in bud and flower. From its parentage, Lady Mary Fitzwilliam and La France, it should make a fine plant for the border; the latter is the best hardy variety here for the production of a constant succession of flowers.

New hardy herbaceous plants seem scarce. I notice only a new seedling variety of the white Japanese Anemone, Lady Ardilaun, which is of Irish origin, and is said to be unusually vigorous, with flowers three and a half inches across, semi-double and faintly tinted with purple on the reverse and on the buds. The prudent gardener will still retain the clump of the old white, for there are few handsomer plants when in flower, and it is of a grace and purity difficult to improve. As this is a seedling of 1892 which is now being widely offered, the rapidity of increase of this Anemone is strikingly shown. A well-colored single pink Japanese Anemone would be a greater gain than any development in the way of dou-



Fig. 12.—*Spiraea Thunbergii*.—See page 83.

The flowers are single or slightly double, and freely produced, of medium size, with prominent yellow stamens, and covering a wide range of most delightful colorings. Some of the varieties produce a second crop of flowers in the autumn, and the flowers usually have a delicate, though penetrating, fragrance of their own which is quite distinct from the odor of the foliage. There are few flowers from which one can gain more pleasing impressions than the single Roses, all of which are distinctly valuable in the garden, whether they be low shrubs or climb over fences or arbors.

The Crimson Rambler is a Japanese Rose of the Multiflora class, which has been frequently mentioned in GARDEN AND FOREST since it was certificated under the name of Engineer, five years ago, and is much advertised at present. It comes with an excellent record as a climbing variety, with its single, but abundant, crop of small double crimson Roses in clusters.

There is at least one first-rate American Rose this season, Mrs. Pierpont Morgan, the cerise sport from Madame Cusin, which is offered as a forcing Rose. With its unique color and

ling. The typical Japanese Anemone is not wanted in gardens, the so-called rose-colored flowers being of a distressing hue—not even an honest Solferino.

New Violets are plants with which everybody experiments very charily or tentatively, for obvious reasons. The new California Violet, which is said to bear very fragrant dark flowers of immense size, on stems ten to fourteen inches long, apparently has merits which entitle it to serious trial.

If Mr. Manda's new Fern, *Adiantum Capillus Veneris imbricatum*, survives the rigor of this winter and its name, its flat fronds and broad pinnæ, like those of *A. Farleyense*, will make it a popular plant for shady places.

It is curious to note the changes in fashion in the Dahlia, though I believe the true Dahlia fancier is wedded to his idols, the beautiful globular flowers, with perhaps a tolerance for the Cactus varieties. A few years ago we had a fancy for the single-flowered kinds, which must be all broad petaled and as circular as possible. We have now arrived at another phase, the novelty of the season having narrow petals reflexed at the edges, and the flowers resembling a wheel without the tire.

There are also some attractive new varieties of Cactus Dahlias, notably a white one, Mrs. Peart.

Cannas are so quickly and readily grown from seed that there is a superabundance of named kinds—mostly of no great merit, but the comparatively recent Königin Charlotte is really a plant of merit and great brilliancy, and will, no doubt, prove of the first order.

At least one house (Henderson & Co.) offers, this season, an important list of early-flowering Chrysanthemums, the best of the Delaux varieties. This is a movement quite in the right direction and offers an opportunity to enrich our gardens with Chrysanthemum-flowers before the heavier frosts set in. Some of these Chrysanthemums produce large flowers, though probably not as big as cabbages, nor with stems like weavers' beams, but they can generally be grown with satisfaction in bush form, and when judiciously disbudded they will produce well-formed flowers.

The early Chrysanthemums do not perfect their growth so much earlier than others, but the flowers come to maturity much quicker after the formation of the buds. In this habit of development there is a most striking difference in the Chrysanthemum varieties.

Elizabeth, N. J.

J. N. Gerard.

Angræcum sesquipedale.

THIS Orchid has now become so common that it is found in almost every collection of this class of plants. Perhaps no Orchid ever caused such a sensation as this when it was introduced, and it has since become famous. It is one of the Orchids Darwin was especially interested in on account of the exceptional length of the spur, and a plant in bloom always attracts attention. This wonderful Angræcum was found in Madagascar by a French botanist near the close of the last century, and when the history of the plants of Madagascar was published in 1822, Angræcum sesquipedale became known to science. Botanists and horticulturists were anxious to introduce it, and many attempts were made, but these were not successful until 1855. Mr. Ellis, a missionary in Madagascar, was fortunate enough to bring home three living specimens to his garden in England, where one of them flowered in the spring of 1857. There was still great difficulty in reintroducing the plant, and for many years it was rare and expensive. In its native country it is said to grow on the trunks and branches of trees, where it has abundant light and air, and in the hottest and lowest districts. A very fine specimen has been in bloom here for more than a month. It is two feet high, and has two branches or stems, which are well furnished with thick, leathery, dark green leaves about a foot long and two inches wide. The flowers are produced on peduncles ten to twelve inches long. When they first appear they are green, and this color continues until the flowers are almost fully developed, when it turns to an ivory-white. As the flowers begin to fade they become pale yellow. The flowers are not very fragrant during the day, but at night they have a strong odor which is not very pleasing. The color and the fragrance of the flowers at night indicate that they are then fertilized by an insect in its native home. The plant in bloom here had sixteen large flowers fully developed at one time; these measured six inches across, and the spurs were twelve inches and a half long. The plant is easy to cultivate. It requires a strong, moist heat, and is grown here in the stove. It also requires plenty of light, but must be shaded from strong sunlight during the summer. It grows well, planted in a basket with crocks and sphagnum-moss, and suspended near the roof-glass. Water must be given during the entire year, and to keep down insect pests the plant must be frequently sponged.

Another large Angræcum in bloom now is *A. eburneum*. It is a large strong-growing plant, with thick, leathery, strap-shaped leaves. The flowers, although not as large as some of the other species, are produced plentifully on nearly erect flower-spikes. The petals and sepals are narrow and green, and the lip cordate and pure white. The flowers are very fragrant, and last for nearly two months. It requires the same treatment as *A. sesquipedale*. It was introduced from Madagascar in 1826.

Botanic Garden, Harvard University.

Robert Cameron.

Amaryllis.

NO bulbous plants show the results of common-sense treatment more plainly or promptly than these, and your correspondent's notes on their cultivation are well timed. Having known the excellent strain referred to, and having raised a number of plants from their seed, I fully endorse what Mr. Orpet says of them. But I would go a step farther and flower the bulbs a month earlier, so as to have a

longer season for growing and maturing. Just here is the point where many have failed in cultivating these plants. After the flower is spent, the plants have been put in a frame or out-of-the-way place to ripen off. The bulb has lost considerably in the production of, perhaps, two spikes of flowers, the soil in the pot is exhausted, when the plant is dried off it is found to be much smaller, and the best it can do the next season is to produce one flower-spike with considerably smaller flowers. Some will not flower at all, but endeavor to recuperate their energies; but with the same result of smaller and weaker plants next year, and flowers unsatisfactory or entirely wanting. Then follows the judgment too frequently pronounced that Amaryllises are not worth growing.

It sometimes happens that very crude methods have resulted beneficially, and my experience with Amaryllis on this line has been very satisfactory. After the flowering I gradually expose them to sunlight and air, setting them in a frame or cool house where the foliage will not get sunburnt. I make sure that their growth receives no check. As soon as the weather permits they are planted out in well-prepared soil in full exposure to sun and receive a mulching of half-rotted manure to prevent excessive evaporation, and to keep the roots cool. They are watered and cleaned as other plants, and the amount of foliage, deep green and leathery, is surprising. The large, fleshy roots cannot be crowded into the pots intended for finishing their growth. Toward the end of the season, and before frost would damage the plants, I carefully lift them and heel them into deep flats and replace them in a cool greenhouse, gradually withholding water when the bulbs will ripen up and they will keep in excellent condition under the stage. Having some long, narrow boxes convenient, I used them, because they were easily laid on the side when necessary to keep dry. When the flower-spike appeared the bulbs were potted up and the same course gone through again.

Seedlings should be pricked off into flats, and as soon as the weather permits they should be planted out in a frame. Later on they can have the full exposure of sunlight and air, and can be treated as other plants. In this way a good collection of Amaryllis can be grown with, perhaps, the least trouble and with excellent results as compared with many other exotics.

Clifton, N. J.

W. Tricker.

Eucharis Amazonica.

THIS is one of the most popular of the bulbous stove-plants, although it is less extensively grown in this country than in Europe. It is indispensable for market purposes where choice white flowers are in demand. Some of the large trade growers on the outskirts of London devote from six to ten large houses to its cultivation to supply the great flower market of Covent Garden. As a general rule, it is grown in pots. These should be of a good size; ten large bulbs should have a twelve-inch pot, and six-inch bulbs a ten-inch pot. The bulbs should be planted quite deep, and they flower best when the pots are well filled with roots. Once in two years is often enough to repot them. Offsets are freely made. These may be potted in six or eight inch pots, from six to twelve bulbs to a pot, and they will soon make flowering bulbs. The compost we find most suitable is two parts of heavy clayey loam and one part well-dried cow-manure; to this is added some broken charcoal and a good dash of sharp sand. The pots should be well drained and the soil pressed moderately firm. When the leaves have completed their growth water should be given rather sparingly—never entirely withheld—and the plants rested in an outer house. When the bulbs are starting a brisk bottom-heat is desirable; with an overhead temperature of sixty-five degrees at night, and a corresponding rise in the daytime a crop of flowers can be had in about a month after the bulbs are planted. Liquid-manure can be given freely as soon as the spikes show, and until the growth is completed, as *Eucharis Amazonica* is quite a gross feeder. If extra fine spikes are desired a piece of bench at the warm end of the stove, or other warm structure, should be used. We use a bench at the warmest end of our Rose-house, and plant in four inches of compost, similar to that recommended for pot-plants, with the addition of some pieces of broken brick. Flowers are not freely produced until the bed becomes a mat of roots. When the plants are well established they should give three crops of flowers a year. Good average spikes will carry from five to six blooms each, occasionally more, with flowers four to five inches in diameter. There are several varieties of *Eucharis* in cultivation, but *E. Amazonica*, called also *Grandiflora*, is the best. Other popular varieties are *E. candida* and *E. Sanderiana*.

A night temperature of sixty to sixty-five degrees in winter, and a bottom heat of seventy-five to eighty-five degrees, suits the plants admirably, although they sometimes do well in a much lower temperature. Abundant watering is necessary in the growing season and frequent syringings. The plants need shade from bright sunshine, but must not be shaded too heavily. Mealy bug and thrips are two of the pests which trouble them. A well-directed force of water from the hose will keep both in check. If they have been allowed to get a foothold, fumigation will destroy the thrips, while sponging with some kerosene emulsion or Fir-tree oil, dissolved in water, will be found the most effectual way to get rid of the mealy bug. Should the Eucharis mite make its appearance all affected plants must be thrown away. We have seen many less heroic remedies tried to get rid of this mite, but none have been successful.

Taunton, Mass.

W. N. Craig.

Violet Notes.

MUCH has recently been written on the Violet and its liability to disease, and it is generally admitted that there is no cure for the dread spot when once it has got well started. We have had considerable trouble in fighting off this disease, and have come to the conclusion that enough runners pulled off in the fall to supply plants required for the next year's crop should be kept in a cold frame all winter. In this way the stock will become strong and vigorous and better able to withstand the attacks of disease should this appear. Our plants are, in every way, better this winter than we have ever had them before, and the crop of flowers is much larger. These plants have not been subjected to fire-heat for three generations, and we hope in this way to keep them altogether free from disease. It is not fair to subject Violets to the heat of our cool greenhouses even as they are kept in the spring months, and after the plants have been forced to produce big crops, to take off stock for the ensuing winter and subject this stock to the excessive heat of our summers. The boxes of cuttings are frozen for several weeks in severe weather in the frames, but if they have made roots in the fall this does not injure them in the least, and they remain there until planting-out time in May, thus saving much valuable time and space in the greenhouse in the busy spring months.

The Violet known as the Farquhar is identical with the kind long grown, both here and in English gardens, under the name of New York, and it would be interesting to know more of its origin. That it is a sport from the well-known Campbell can scarcely be considered, it being in every respect a direct antithesis to that variety, and resembling much more the Marie Louise; indeed, it is hard to distinguish between Farquhar and Marie Louise as usually grown.

If Marie Louise will do well, there is no other kind as good. Growers recently had an opportunity of noting their excellence when these flowers were exhibited in Boston by Mr. Mackay, of Framingham, Massachusetts. They had been grown in pots in a cool house and were of superb color, large size, and very fragrant. As long as such fine flowers can be grown there is still a future for the old Marie Louise.

South Lancaster, Mass.

E. O. Orpet.

Chrysanthemums.

AS the season for the distribution of new Chrysanthemums approaches, some suggestions as to their treatment may be timely. The stock sent out now is better than that of a few years ago, owing, in a measure, to competition, but due even more to careful attention to the time of propagation, so that the plants are brought into good condition at the time of distribution, and also to a better general knowledge of their cultivation. Formerly we had a considerable proportion of overdrawn plants, grown crowded and pot-bound. A small percentage come in that condition now, but the majority are dwarf, healthy plants in a growing condition, showing that they have been struck and rooted as they should be—within a period of five or six weeks. It is hard to deal with a woody pot-bound plant. The best thing to do is to take the tip out, and this will probably make a better plant than the original would have made under equal conditions. We may force a few cuttings out of the remainder of the plant in a warm moist house or a propagating-frame. With younger plants the task is easier. The treatment must depend upon whether the object is specimen plants or blooms. For a specimen plant we take out the tips merely, thus inducing it to break freely; for at all stages the softest wood always breaks best, and, therefore, during the whole season, if neat bushy specimens are desired, the shoots must not be allowed to run on for a week or two, and then be cut off six or eight inches, but they must be

stopped every day. For specimen blooms we cut the plants in rather hard, so as to get suckers, if possible, since these make the best cuttings for blooms. In doing this it should be remembered that good plants can be raised from leaf-eyes. Occasionally in cutting down a novelty we have managed to get three or four leaf-eyes in addition to the tip, which we have sometimes had to secure with a piece of bast to make it firm in the cutting-bench; such a cutting will root with as much certainty as any others.

It often happens that in packing for shipment the balls are pressed hard when the soil is wet, to keep the roots together and to keep them from drying out. This solid ball should be removed and the plants put into loose soil composed mainly of leaf-mold and sand. The plants intended for specimens we put into three-inch pots, and gradually shift them along in the ordinary way as they become rooted. Stock intended for blooms we put into ordinary flats, and if given room enough they can stay here until the season for striking cuttings is past, which will not be until the first week in July.

Our plants intended for specimen plants have lately been put into three-inch pots. In the course of three or four weeks they will be rooted sufficiently to have another shift, a little heavier soil being used this time. Our stock in frames will soon begin to move as we admit sunshine and air; those in the cool greenhouse may be cut down early in March, and these will furnish a good crop of root-cuttings in May.

Wellesley, Mass.

T. D. H.

Grapes under Glass.

THE second house may now be got ready and started for a successional crop of grapes. In the first house, started at the end of December, the eyes are now well advanced, especially those of the Black Hamburg variety, which is always the first to start, and disbudding should be begun as soon as the strongest shoots can be distinguished. These are in all cases selected, although one is often tempted to sacrifice a strong shoot if it is far from the rod, for the sake of keeping the spurs short; but it must be borne in mind that in doing so a better bunch of grapes is also sacrificed. One shoot is left to each spur, and we find this quite enough, though some growers leave two. This is undoubtedly a mistake, as it causes overcrowding of the foliage and otherwise impairs the vine. One healthy, well-developed leaf is preferable to a dozen weak, overcrowded and sickly ones, and upon the foliage, to a great measure, depends the success of the crop. Tying down should never be attempted until the shoots are strong and firm, as they are easily broken off at the joints, and should be brought down to the wires gradually and carefully. Pinching must soon be attended to. Several bunches will form on each shoot, but all should be removed, with the exception of the strongest, which is generally, though not always, the one nearest the rod. After the bunch has been selected the point of the shoot should be pinched out two joints beyond it. In the case of young vines the leaders are allowed to run, the length being regulated according to the dimensions of the house. A top-dressing of fresh cow-manure is then given, and well watered in, as this watering will have to carry the vines past the flowering and setting stage. A thorough soaking is given, after which the atmosphere of the house is gradually dried up and kept dry through the flowering period. The pollen is thus kept dry, and the free setting of the fruit is promoted. As soon as the fruit is set the syringe must again be used freely, and the atmosphere kept moist to prevent the attacks of red spider and thrips. The latter is probably the most troublesome of all insect pests that attack the Grape-vine, and a sharp lookout must be kept to prevent its getting a hold. It makes its first appearance either at the top or bottom of the rods, and as soon as it is seen we syringe the infected parts with a solution of antipest, which we try to keep off the fruit as much as possible.

Tarrytown, N. Y.

William Scott.

Correspondence.

Inscriptions on Public Monuments.

To the Editor of GARDEN AND FOREST:

Sir.—You explained some time ago the superiority of the statue of Nathan Hale as a work of art to most of the others which profess to adorn New York, and you noted the fact that its excellence was instinctively recognized by the public, so that it is a source of genuine popular instruction as well as delight, while its inferior rivals neither please the eye nor inspire the soul. May I add a word with regard to the matter of inscriptions upon public monuments, as no better instance of

a good one could be found than that upon the base of the Hale statue? It runs thus:

"Nathan Hale, a Captain in the regular army of the United States, who gave his life for his country, in the city of New York, September 22d, 1776. 'I regret that I have but one life to give for my country.' Erected by the Sons of the Revolution of the State of New York."

This, I think, supplementing the dramatic expressiveness of the figure itself, tells enough to satisfy, for the moment, any person, if such there be, to whom Hale's name is strange, and tells it in such a way as to excite sympathy and interest. Besides this, it contains no superfluous words, and has the literary merit of directness and conciseness. And the quoting of Hale's own words is a proper tribute to their fame as well as to his character.

In contrast to this the inscription on the base of the statue of Ericsson, in Battery Park, is as inadequate as is the statue itself. The name is on the front of the pedestal, and on the back we read:

"The City of New York erects this statue to the memory of a citizen whose genius has contributed to the greatness of the Republic and to the progress of the world."

These words tell us nothing that we should not have known without them. It is presupposed that every citizen to whom a statue is erected in a public place has well served his compatriots, and through them the world at large. But there are many kinds of genius, many ways of being serviceable. An inscription which might with equal propriety serve on the memorial of any other noted American was not worth the trouble of writing. What was needed on the Ericsson monument was something specifically explanatory of Ericsson.

I know that we are sometimes told that no monument ought to bear anything but the name of the man whom it honors; in other words, that no man deserves a public monument whose identity is not known, whose services are not familiar to all his fellow-countrymen. But I think, under any conditions, this is an exaggeration of the broad truth that only real servants of the public deserve to be publicly commemorated. And certainly it is not a code of procedure to be acted upon in a city so big and so cosmopolitan as ours. Washington, Lincoln, Grant—men like these do not need to have their identity explained, for every one, even the newly landed foreigner who has any intelligence whatever will have heard as much about them as an inscription could tell. Even in such cases a few pregnant words on a statue's base, especially if they were once uttered by the man commemorated, often help to arouse the imagination and quicken the pulse. But we must have many foreigners, many school-children, and possibly some adult Americans even, who are not familiar with the names of Hale, Greeley, Seward, Ericsson, Farragut and many another man who is worthy of a public memorial. We are not likely to have too many statues, provided we erect none which are not genuine works of art; and, when they represent men about whom the slightest doubt may exist in the mind of the humblest passer-by, let them bear some words of terse suggestion or explanation. But to be of this kind the legend must be definite, certainly not vague; and it ought, of course, to be free from such verbal faults as may be noted in the Ericsson inscription, which says "whose genius has contributed—" although referring to a man whose genius is no longer at work. Again, it ought to be in plain sight and easily read. I have found from observation that few persons discover anything more on the Ericsson pedestal than the mere name in front; and even if one does examine the back, the lettering is not readily deciphered. On the other hand, the Hale inscription is on the front of the pedestal where no one can miss it; and it is so plainly printed in raised letters of bronze applied to the smooth granite that every one must see and read it.

I am not discussing just now the artistic merits of our monuments, else I might well enlarge upon a theme already familiar to the readers of GARDEN AND FOREST—the degree to which the right effect of a figure depends upon the appropriateness and the beauty of its pedestal. This point, again, could not be better illustrated than by the base of the Hale monument. Its circular shape, so well suited to the composition of the lines of the figure, the delightful color of its reddish granite, and the refined character of the architectural details, are not more remarkable than the skill with which the inscription has been applied, so that it charms the eye even before it speaks to the mind. But the public may be trusted, I think, to appreciate the excellence of this pedestal, as well as that of the statue it bears, and to apply the standard thus set to all future memorials which may be erected in New York. I will only add that, while every one is aware that the statue is the work

of Mr. McMonnies, it may not be as generally known that the design of the pedestal and its inscription is due to Messrs. McKim, Mead & White.

New York.

M. G. Van Rensselaer.

The Effect of Bad Seasons on the Growth of Trees.

To the Editor of GARDEN AND FOREST:

Sir,—In the course of the study of Spruce-timber in the state of Maine, data have been discovered which illustrate strikingly the effect of the weather upon the growth of trees. The most satisfactory evidence of this kind is a band of very thin rings in the trees throughout the region, these rings corresponding with a series of cold and stormy years known to have occurred in the early part of this century.

There is abundant testimony to the inclemency of the years during and immediately following the war of 1812. Their unusual severity in the state of Maine is established from a variety of sources. Meteorological records kept by Professor Parker Cleveland, of Bowdoin College, prove the general low temperature of these years, while histories of the state and of different counties, private records and oral testimony tell reliably of the storms and frosts, which probably were responsible for the effects upon vegetation to a greater extent than the general low temperature. The seasons of 1812, 1815 and 1816, however, seem to have been the most severe. In the two last named almost no crops were raised in Maine, the year 1816 marking the culmination of the series. A considerable snow fell about the 10th of June, causing the leaves to fall from the deciduous trees in some regions, while frosts and ice are said to have formed in every month of the year. It must be distinctly stated, for reasons which will appear later, that 1812 was the first of the inclement seasons, while the year 1817, on the other hand, was the last which by any means can be included in the series.

Turning now to the record left on the trees by these cold seasons, it is to be said that throughout the state the older trees* uniformly show it. Generally six or seven rings are thinned. As few as three have been noted, but more frequently the rings concerned overrun the usual number. Generally, the belt is very plainly marked, the rings being reduced to but a fraction of their usual thickness. Frequently within the belt there is a group of three rings reduced nearly or quite to microscopic dimensions. This feature is so striking, and has been so widely formed, that the conclusion has been inevitable that the phenomenon is due to some common cause. This cause, not improbably, was the severe weather of 1816, stopping growth and causing the deposit of the small-celled wood characteristic ordinarily only of the autumn. On this supposition, the year 1816 might have grown all three of these rings.

Confidence that the facts have been rightly interpreted is established by the size of the region through which the thin rings have been found. My investigations have extended across the entire state of Maine, from the New Brunswick line into northern New Hampshire and the White Mountains. Having personally counted the rings of some 1,400 Spruce-trees throughout that region, I believe it is a fact that east of the White Mountains I have never looked for this record and failed to find it in a tree that eighty years ago was in condition to receive it. Some trees on the high slopes of the White Mountains do not show this feature, but it seems probable that their exposed situation may be the explanation of this, and not that they are on the boundary of the region in which the cold years were felt.

One more matter remains to be treated—the position of the belt in the tree. Most of my observations were made in the winter of 1893-4, between which time and 1817, seventy-six seasons of growth had passed. Supposing, then, that no effect of the cold years held over into succeeding ones, the first ring that is distinctly thinned, in case each year deposits a single ring, should be the seventy-seventh from the bark. This is, in fact, sometimes the case, but far more frequently the thinning begins nearer the heart. Reckoning from the inside of the belt, and from the rings just identified with the year 1816, a similar result is reached. The rings are too many to correspond with the years, the discrepancy in most cases amounting to three or four. The conclusion, from the data gathered seems to be that, even in ordinary seasons, most or all of our forest Spruces deposit occasionally an extra ring. This is an important physiological fact, and it is at variance with accepted

* Spruce only is included in this statement. Of other species a few Hemlocks examined showed the same thing, while Pines examined in larger numbers, and in a variety of conditions, do not show it. Belts of thin rings are found, but, maintaining no constant position, they are judged to be due to individual causes.

ideas in the matter. Disks of Spruce were cut from the region of Moosehead Lake, in Maine, and from eastern slopes of the Presidential range, in New Hampshire, and sent to the United States Forestry Division for testing their strength. When examined by the Division most of these disks which show the full number of rings to correspond with the cold seasons have eighty rings outside of all the perceptible thin rings.

Evanston, Ill. Austin Cary.

[To substantiate his view Mr. Cary sends a table, compiled from his own notes, on the measurement of these disks. It is only necessary to add that the figures substantiate what has been said. In most cases the widest one of the zone of narrow rings measures half a millimeter, the narrowest ones about a quarter of a millimeter, while the nearest ring on the inside or the outside of the zone averages a full millimeter in width.—ED.]

Meetings of Societies.

The American Carnation Society.—I.

THE annual meeting of this society, which was held last week in Horticultural Hall, Boston, was only its fourth one, but the number of delegates and visitors and the size and completeness of the exhibition would have done credit to an association of much greater age. Mr. Eugene Dailedouze, the President, frankly stated that the hope of obtaining new varieties was the life of the organization. Both flowers and plants had been improved much in the past, but still they were in search of others superior to anything yet possessed, and, so long as they were inspired by the prospect of success in this direction, the society would continue vigorous and progressive. All the best commercial Carnations are worth a good deal apart from their exhibition value, and Mr. Dailedouze offered some suggestions as to the best way of finding out the full merits of new plants as all-round varieties. He advocated the plan adopted by the Chrysanthemum Society of appointing reputable judges in different parts of the country where Chrysanthemums are produced largely, who, without favor or prejudice, can pronounce judgment on new plants at their homes. Judges at these Carnation centres should see the plants at least twice during the season while they are growing, so that they can report at the annual meetings as to their habit and general qualities. This would enable the judges to observe the weak points of a plant as well as its good ones. No one can estimate the merits of a plant simply from seeing a cluster of its flowers on an exhibition table. The President also suggested the offering of gold and silver medals for new varieties, and advised that no medals should be given for a variety unless it had been tested in five or six distinct localities and reported on at the annual meeting. This would give an idea of its general usefulness and decide whether it had more than local value. Persons who are testing new varieties, and writing of them, ought to describe the house in which the plants are grown, the composition of the soil, any special conditions of their cultivation and the varieties which they most resemble in good or bad habits. He gave many examples of plants like Mrs. Fisher, Lizzie McGowan and Tidal Wave, which are not good in some parts of the country, while they are extremely useful in others. In his opinion fifty blooms at least of a new variety should be shown when competing for a prize. This requirement ought to be no hardship, because no one would think of disseminating a new variety unless he had a thousand plants of it, and if fifty exhibition blooms cannot be secured from that number of plants the variety is not worthy of being put on sale. He also advocated the showing of plants of new varieties as well as their cut flowers, so as to afford an opportunity for observing their habit and character of growth. He also thought that new varieties which had been grown under glass all summer, when exhibited, should be put in a separate class from those which had grown out-of-doors. He did not agree with the statement that certain plants should be grown for cut flowers, and others should be used for cuttings. A Carnation is in its best possible condition when producing the best flowers, and cuttings from such stock ought to be the best that can be secured. No science can be displayed in growing Carnations for cuttings, but the test of skill lies in producing good flowers. No poor or half-grown plants ever throw first-class flowers.

In Mr. Lonsdale's paper, which discussed alphabetically sixty-seven different varieties, noting their good and bad qualities and pedigrees, and explaining why some had been superseded and others had remained popular, he stated that several

varieties had been so long before the public as to discredit the prevailing opinion that a variety of Carnation is necessarily short-lived, and that new ones must be constantly produced simply to take the places of those which die out. Buttercup had been grown, for example, for nearly twenty years, and it is still in the front rank. This is a variety with which Mr. Lonsdale had never been successful until three years ago, when he began to keep it under glass all the time, and since then it had done admirably. He thought that many other varieties which had failed in different places might show themselves of great value when treated in the same way, just as Roses and Chrysanthemums are. Some remarkable prize-winners, like Grace Battles and Edna Craig, are now rarely seen because they are subject to disease. One variety, named Sea Gull, which won a gold medal at New York three years ago, when it defeated Lizzie McGowan and sold for a good price, was found on trial to be so worthless that it was never sent out. This shows the need of some radical change in the method of judging novelties.

Professor Halsted, of Rutgers College, read a paper on the fungous diseases which attacked Carnations, describing the rust, the leaf spot, the black speck, the ring mold and bacteriosis. He had specimens of each of these principal enemies of the Carnation placed under the microscope so that they could be studied and detected. He stated that there were other diseases which attacked the Carnation, but these five were those which were to be expected and which must be contended with. He recommended every grower to keep on hand a good description of each of these diseases and to examine every affected plant with a hand lens, or, if possible, with a compound microscope.

Mr. John N. May's new seedlings, Maud Dean, Lena Saling and Dean Hole, which we have already described in this journal, received certificates of merit. Certificates were also given to Storm King and Meteor, exhibited by the Cottage Gardens, Queens, New York; to Aramazinda and Triumph, exhibited by E. G. Hill & Co., of Richmond, Indiana, and to Della Fox, exhibited by Myers & Santman, Chestnut Hill, Pennsylvania. The committee commended the last firm for sending a plant of Della Fox to the exhibition, and a plant, too, which had been grown on a bench and not in a pot, so that they could judge very well of its character for commerce. The exhibition was admirable in quality, and, besides the Carnations, there were enough Palms, Orchids and other plants contributed by Mr. John L. Gardiner, Mr. N. T. Kidder and others to serve the purpose of general decoration. In the class for one hundred blooms the plants which won were: Alaska, white; William Scott, light pink; Tidal Wave, dark pink; Jubilee, scarlet; Ferdinand Mangold, crimson; Buttercup, yellow; Minnie Cook, variegated. For fifty blooms, the prizes were gained by Storm King, white; William Scott, light pink; Jubilee, scarlet; Meteor, crimson; Bouton d'Or, yellow, and Helen Keller, variegated. A special premium, offered by the Florists' Exchange for a vase of flowers showing the best culture, was given to Edwin Lonsdale for a group of variegated flowers of Helen Keller. In the report it was stated that the premium was awarded to Mr. Lonsdale because the variety was difficult to grow to such perfection, and, therefore, it showed the highest color. Equally well-grown plants were shown by Dailedouze Brothers and H. K. Southworth, the latter with the yellow-flowered Buttercup. The other leading prizes were taken by W. E. Chitty, Dailedouze Brothers, E. G. Hill & Co., William Nicholson, H. K. Southworth, C. W. Ward and Fred Dorner.

New York was selected as the place for holding the next annual meeting. Fred Dorner, of Lafayette, Indiana, was elected President; John N. May, of Summit, New Jersey, Vice-President; A. M. Herr, of Lancaster, Pennsylvania, Secretary, and Charles H. Allen, of New York, Treasurer. A committee, consisting of A. M. Herr, Edward Lonsdale and Robert Craig, were appointed to revise the list of Carnations, to strike out the names of varieties no longer grown, and prepare a new working list.

For lack of space our notes on some of the new varieties, and on a few of the standard sorts as well, are postponed until next week.

Notes.

Following the example of the common garden Pea, a sport of the Sweet Pea seems to have abandoned its climbing habit and developed a dwarf variety which grows only five inches high, making a low tuft of short branches, which bear white flowers for an unusually long period, and in such quantities as to cover the plant. The plant is named Cupid, and Burpee

& Co., of Philadelphia, announce that it will be distributed next year.

A statue has recently been erected at Montpellier, in the south of France, to commemorate the life and services of the distinguished botanist, Gustave Planchon, to whom, after a study of the phylloxera on American Grape-vines, was largely due the rehabilitation of the Vines of France after they had been ravaged by that insect. It is the work of the sculptor Baussian, and represents a laborer offering a Vine-branch to Planchon.

Small compact plants of *Spiraea Thunbergii*, of which we have spoken on another page of this issue, have sometimes been used for winter-forcing with good effect, and we have lately seen some good branches of this plant which made a fair show of flowers when placed in water. The buds are fully formed in autumn, and its habit of early flowering is often indicated by the white blossoms which it bears during mild days in November.

Cos Lettuces have never been as popular in this country as they are in Europe, although for flavor and tenderness the best of them are superior. Of course, they form no head, but if the leaves are gathered up and tied the inner ones will soon become blanched and brittle. A correspondent of *American Gardening* has found that a slender rubber band slipped over the outside leaves of the plant will answer every purpose, and, of course, this is much more expeditious than tying.

A bulletin from the Agricultural College of Texas, which treats of fruits for that state, gives the information that native Plums of the Wild Goose group and of the Americana group do not seem so well adapted to Texas as those of the Chickasaw group. The European varieties have almost entirely failed. Japanese varieties also seem to do well. The Kaki, or so-called Japan Persimmon, is also promising, and thrives well in Texas when budded on stock of the native wild Persimmon.

There seems to be no end to the problems which confront workers in the higher branches of horticulture. Some men of science in France have been making a study of plants grown from the seeds produced on grafted plants, and they seem to have demonstrated that the seedlings may partake of the character of the stock as well as of the cion—that is, a seedling from a graft may be, in a certain sense, a hybrid inheriting the qualities both of the plant which is used as a cion and the plant used as a stock. These experiments have been confined to herbaceous plants, and they show that, for example, when a Turnip is grafted on a stock of Garlic Mustard, plants from the seed showed a marked reversion to the wild type, and when this Garlic Mustard was grafted on Cabbage the seedlings showed a likeness to the Cabbage-plant, and had a less marked smell of garlic than the wild plant, combined with something of the odor of the cabbage-leaf. Of course, if this is true, it is not improbable that the same law holds throughout the vegetable kingdom, and when, for example, we cross two varieties of grafted Apples the seedlings may show not only the characteristics of the parent plants, but of the cions upon which they grow. In this way a hybrid Apple may have four parents, to each of which it is responsible for some of its characters, not to speak of the qualities it may have inherited from the numerous ancestors of each of these parents.

Dr. Hoskins has been giving instructions about planting orchards in northern New England, and some of his advice, while by no means new, cannot be too often repeated. Much depends on getting first-rate trees to start with, and the stock should be bought, therefore, of a trustworthy firm and not of traveling peddlers, who too often supply poor trees of poor varieties in poor condition. When taken from the nursery as much of the roots should be taken as possible, and in an unmangled condition, but where their ends are bruised they should be trimmed smoothly with an undercut with a sharp knife. They should be planted as quickly as possible in their natural position, with the roots sloping downward somewhat from the trunk and with fine soil carefully worked in about the fibres, and firmly set with a slight inclination toward the southwest, otherwise the prevailing wind will bend them as much the other way in a few years, and the hot sun will injure the bark on that side of the tree. The first point in the selection of a position for an orchard is to have good soil. An Apple-tree has not only to grow, but it has to produce abundant fruit if it will pay. The tree may appear to thrive when it has not much nutriment for a while, but as it increases in size it will demand more food, and if it does not get enough it will have a scrubby growth, even before it comes into bearing. Where land has been run down it must be enriched until

it is good enough to give a crop of Corn, and unless a young orchard makes an annual growth of, at least, a foot of new wood every year, the ground should be manured thoroughly.

In a recent address, Dr. E. H. Jenkins, of the Connecticut Experiment Station, argued against the usual practice of estimating the value of stable-manure simply from its contents of nitrogen, phosphoric acid and potash. Stable-manure contains elements of value to soils which chemical fertilizers cannot supply, and without which they cannot produce their full effect. These elements regulate the heat and moisture of the soil, together with its powers of nitrification. This organic matter produces the black mold which holds water, makes leachy soils retentive of moisture and keeps other soils, in which chemical fertilizers are used freely year after year, from becoming hard and cloddy. This humus is a specially valuable part of manure, because we do not get it in commercial fertilizers, and we cannot get it in any other way in such good condition as we can through the manure pile. These facts emphasize the importance of a supply of litter in the stable, not only as an article of comfort and cleanliness to animals, but because it adds largely to the value of the manure decaying along with it and performing an important use in the soil. Stable-manure exposed to leaching and drainage will lose the greater part of its value, and even in a tightly packed pile one-quarter of its nitrogen and one-third of its organic matter may be lost by fermentation in half a year. Kainit, where the manure is to be used on sandy soil, and superphosphate gypsum, where the manure is to be used on heavy soils, when mixed with the manure pile, will entirely prevent the loss of nitrogen and largely preserve the organic matter. A mixture, in the proportion of four parts of dissolved phosphate rock with three parts of plaster, should be used at the rate of one to one and a half pounds a day for each head of stock, and when kainit is used the proper amount is from one and a half to two pounds a day.

But for the two disastrous periods of zero weather which desolated the Orange groves of Florida the market here would now have been well supplied with fruit from that state. Probably the number of oranges destroyed in Florida would amount to as many as the entire California crop, which is arriving under the most favorable conditions for profit to the growers. The great bulk of the supply from the West Indies is already here, although these islands will provide limited quantities for a month to come. The Valencia fruit has been injured by cold, and the season for Sicily oranges will not be at its height until the larger part of the California supply will have been marketed. And yet choice fruit from California commands little more than it does in ordinary seasons. A very limited supply of hot-house strawberries and hot-house grapes can be disposed of at fancy prices, but the great mass of buyers will only pay reasonable rates for fruit for daily consumption, and they will go without oranges rather than buy them at \$5.00 a box, however high their quality. It should be said, too, that the California fruit is unusually good this year. There has been no chilling weather on the Pacific coast, so that the oranges are more juicy than they usually are, and the crop this year is said to be the best in color and quality ever sent to the east. Perhaps the dry and cottony quality of California oranges in some former years has prejudiced New York buyers against them, and the fact that frozen and, therefore, worthless fruit from Florida has been sold to some extent, has also made them cautious. However this may be, the best California oranges are not realizing what they would naturally be supposed to command under the present remarkable conditions. Nevertheless, the oranges which are arriving here at the rate of twenty to twenty-five car-loads a week, are all disposed of at good prices, and the lower grades are selling for more money than in ordinary years. Altogether, then, the California fruit-growers have nothing to complain of, and it is probable that if the Florida supply had been uninjured the year would have been a disastrous one to them. Oranges from Jamaica, Havana and Abaco, one of the Bahama Islands, and from Sicily are selling well, but the fancy fruit of the season, no doubt, comes from California. A few heads of cauliflower which came from California with the first shipments of oranges found a ready sale, and owing to the good quality and the dearth of fresh vegetables from the south, cauliflower is now coming across the continent by the car-load. Large, bright heads sell at retail for fifty cents each. Artichokes from southern France and Algiers are in good supply, and sell at twenty-five cents each. String-beans are coming from Bermuda, and all northern-grown hot-house vegetables are in good demand and profitable to the growers.

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLE: —City Engineers and Public Parks.....	91
Notes on North American Oaks. (With figures)	C. S. S. 92
FOREIGN CORRESPONDENCE: —London Letter.....	W. Watson 93
PLANT NOTES:	95
CULTURAL DEPARTMENT: —Grapes in North-eastern Vermont. T. H. Hoskins, M.D.	96
Cinerarias.....	William Scott 97
Nelumbiums.....	W. Tricker 97
A Few Annuals.....	J. N. Gerard 97
CORRESPONDENCE: —The Cultivation of Tea in America.....	H. J. Alves 98
Flowering House-plants for Early Winter.....	Lord S. La Mance 98
Notes from Wellesley, Massachusetts, and its Vicinity	W. N. Craig 98
MEETINGS OF SOCIETIES: —American Carnation Society.....	99
RECENT PUBLICATIONS	99
NOTES	100
ILLUSTRATIONS: —Quercus Toumeyi, n. sp., Fig. 13.....	94
Quercus Toumeyi, n. sp., Fig. 14.....	95

City Engineers and Public Parks.

THE new Mayor of this city, acting under powers conferred on him by the recent legislation, has removed the entire park commission and appointed a new board. The old board have forfeited public confidence in many ways, but their most serious offense was that in the construction of a pleasure drive along the shores of the Harlem River they refused to consult with their landscape-architect, and directed a city engineer to prepare plans and specifications and carry on the work. The people of this city have come to understand that public grounds as surely demand artistic treatment as public buildings do; and that to entrust the planning of a public park to one who is not skilled in landscape design is as much an outrage against civilization as it would be to erect a municipal building without an architect. It is a pleasure to announce that the new board has taken the earliest opportunity to put the speedway under the supervision of Mr. Vaux, and to order the engineer in charge of the work to report to him. This elevates the skilled park-maker of the department to his proper rank at the head of these works as their designer, and places the engineer where he belongs, subordinate to him and in charge of matters of construction under his direction.

Now, we may conceive of an engineer who has a feeling for landscape, and who carries on his work with due regard to its effect upon the scenery, but his education would naturally give his mind another bias. When told to construct a road between two points, nothing in his professional training leads him to make any effort for harmonizing his work with the landscape. He often takes pride in making it obtrusively distinct from nature, since in his view, and this is in a manner a true view, it has a beauty of its own which should be displayed. It is his business to make a convenient road and build it as economically as possible. What he aims at is to facilitate traffic between two points, and he is not to be lured from his professional duty by any appeals of natural beauty. Naturally, a man whose entire training and practice has led him to ignore the element of natural beauty, would be the last one to select

for laying walks and drives in a park, for here this beauty is of paramount importance. These roads and walks are not for traffic; they are not primarily for pleasure, driving or walking, but they are prepared, as the shelters and seats are, to enable the greatest number of people to enjoy the beauties of the scenery with the greatest comfort. A park road, therefore, which needlessly mars the landscape, defeats its fundamental purpose. Of course, we are now referring to park work in general, and not especially to the Harlem Speedway, in which the road is the essential element.

No doubt, the plans of the speedway will have to be revised. If proper professional advice had been taken before the work began, much of the picturesque slope above its line would have been purchased by the city, so that it could have been used to add to the dignity of this unique water-side parkway, which, with proper treatment, could be made one of the most beautiful of the city's possessions. Certainly, on the sidewalk along the river provision must be made for ample space and enough soil for a row of trees, without which the road will be altogether commonplace and incomplete. To change the plans will cost the city something, but self-satisfied ignorance, in responsible places, is always expensive to the people. It is to be hoped that the new Board will not shrink from the additional duty which the blunders of their predecessors have thrown upon them, but will attack the work with intelligence and resolution.

We may add here that a large proportion of the cities of this country have no professional landscape-designer, and public parks and grounds are all under the charge of a city engineer. Naturally, the result is painful to every one who is qualified to pass judgment on a landscape. Apart from the fact, as we have stated, that his training has all been directed to give him skill in another direction, there is another mistake which the city engineer almost invariably falls into when he becomes a maker of parks. This trouble, as tersely stated by Mr. John C. Olmsted, in an article lately published in the *Journal of the Association of Engineering Societies*, is, "that he is often disposed to solve the problem presented by each element of a park independently of every other." That is, he will lay out a new piece of road one year, he will build a conservatory or dig a pond the next, and he will carry on each fraction of the work in a way which seems most convenient and economical considered by itself without any comprehensive idea of the influence that these separate features will have upon each other, or upon the park as a whole. Such work must, of necessity, be unrelated and inconsistent. No city would think of erecting a municipal building without some architect to make a general plan, or without knowing what the various apartments are to be used for, or what sort of necessities are to be provided for, and yet it would be quite as sensible to start a city hall without any plan or to permit radical and inharmonious changes in it while the building is in course of construction as it is to fritter away money on park construction in a fragmentary and disconnected way instead of working steadily toward the ideal of a competent designer.

Wherever parks must be entrusted to a city engineer, the man selected should be one of broad training and liberal education, as well as technical knowledge within the narrow limits of his profession. He ought to understand not only that every park should have a plan with consistent features and unity of motive, but he ought to know enough to treat different ones so that each shall supplement the deficiencies of the rest, so that all may stand properly related in a comprehensive and harmonious park system. Men who are endowed with the creative faculty united with a genuine feeling for the aesthetic and poetic value of scenery are rare, indeed. When they appear, their best efforts are too often unappreciated and neglected. In more than one city in the United States and the Dominion of Canada designs of parks, prepared by real masters, have been nominally accepted, and then so warped

in construction from their original meaning and purpose that they are not even good parodies of the artist's ideal.

SINCE the foregoing was in type the engineer in charge of the Harlem Speedway has expressed resentment at being considered subordinate to the landscape-architect, and has sent a letter of resignation to the Park Board. This resignation was not accepted at once, as would have been expected, and the Board passed a resolution with the apparent purpose of limiting the power of the landscape-architect. This resolution places him in charge of the "landscape and architectural features of the work subject to the supervision and approval" of a committee consisting of Mr. Frederick Law Olmsted, Mr. Augustus St. Gaudens and half a dozen distinguished architects. Of course, this was not a well-considered step. It degrades the position of landscape-architect from what ought to be its true rank in the well-ordered system of park management. It is an indignity laid upon Mr. Vaux personally, in that it assumes beforehand that his work needs supervision. It assumes that a pleasure-ground need not be a consistent work of art with unity of motive and purpose, and that it is possible to separate such a work into its elements with an engineer to make the roadway, an architect to build the walls and a gardener to treat the landscape, each one working without regard to any comprehensive and congruous plan. Fortunately, the gentlemen who constitute the new Park Board are men of integrity and intelligence, and, therefore, there is no reason to fear that they will cling obstinately to this erroneous conception. After they have given more study to the matter, and the full light of public discussion has been turned upon it, we may expect them to abandon the untenable position they now hold.

Notes on North American Oaks.

Quercus Toumeyi.—I propose this name for a small White Oak* discovered in July, 1894, by Professor J. T. Toumey, of the University of Arizona, on the hills above the mining town of Bisbee, among the Mule Mountains, in south-eastern Arizona. It is a tree twenty-five to thirty feet in height (see figs. 13 & 14 on pages 94 & 95 of this issue), with a short trunk six to ten inches in diameter, dividing near the ground into spreading limbs, which form a broad, irregular head. The bark of the trunk is about three-quarters of an inch thick, deeply furrowed, dark brown tinged with red, and broken on the surface into small, thin, closely appressed scales. The summer branchlets are light red and more or less covered with pale tomentum, and in their second and third years are slender, with thin dark brown, nearly black bark divided into small plate-like scales. The leaves are crowded at the ends of the branches, oblong or ovate, rounded or cordate at the base, acute and apiculate at the apex, entire with thickened revolute margins, or remotely spinulose-dentate, or often minutely three-toothed at the apex, thin and firm, light blue-green, glabrous and lustrous above, pale and pubescent below, from one-half to three-quarters of an inch long, from a quarter to a half of an inch broad, conspicuously reticulate-venulose, with slender midribs raised and rounded on the upper side and thin arcuate primary veins; they are borne on short petioles about one-sixteenth of an inch long and probably fall early in the spring with the appearance of the new growth. The flowers are unknown. The fruit is sessile, solitary or in pairs, and ripens in June; the nut is oval or ovate, from one-half to two-thirds of an inch long and a quarter of an inch broad, light brown and lustrous, covered at the acute apex with pale pubescence, and glabrous on the inner surface; the cup, which encloses less than a quarter of the nut, is thin and shallow, cup-shaped or

turbinate, light green and pubescent within, and covered on the outer surface by thin ovate acute regularly and closely imbricated light red-brown scales with short rounded tips and coated on the back with hoary tomentum.

Quercus Toumeyi forms on the Mule Mountains the principal part of the narrow forest zone immediately above that in which *Quercus Emoryi* is the principal tree, the two trees mingling toward the lower margin of the belt of *Quercus Toumeyi*. Among North American species *Quercus Toumeyi* most resembles some of the spinescent or entire-leaved forms of *Quercus undulata*, from which, however, it differs in the dark brown deeply furrowed bark, that of *Quercus undulata* being ashy gray or light reddish brown and scaly, in the nearly black bark of the branchlets, the thinner and less pubescent leaves, and in the thinner cup-scales.

Quercus Grisea.—Liebmamn's type of this species, collected near El Paso by Charles Wright, shows that, as Engelmann always believed, this is a form of the very polymorphous south-western *Quercus undulata*. It is a plant with cordate, mostly entire leaves, and nearly identical leaves can be found on plants growing on the cliffs above the cañon of the Arkansas River, in Colorado, which produce, among leaves of several different shapes, the undulate-dentate leaves of Torrey's type of *Quercus undulata*.

Quercus undulata, which can always be recognized by the blue color of its foliage from the green-leaved Rocky Mountain White Oak, *Quercus Gambelii*, with which it has often been confounded, is distributed from the cañon of the Arkansas River, in Colorado, to western Texas and through New Mexico and Arizona to southern Utah and Nevada and to northern Mexico. Usually shrubby, it was found last summer by Professor Toumey growing into a small bushy tree in some of the sheltered cañons of the mountain ranges of south-eastern Arizona. It is a form of this species with small entire or spinescent leaves (*Quercus pungens* of Liebmamn), often clothed on the lower surface with fulvous pubescence, that covers the mountains of central Arizona, south of the Colorado plateau, with vast thickets six or eight feet high, from which cattle and sheep obtain the best fodder furnished by this region.

A good deal of confusion with regard to our south-western Oaks has been caused by the mistaken reference of one of the New Mexican and Arizona White Oaks to Liebmamn's *Quercus grisea*. This Arizona tree (*Quercus undulata*, var. *grisea*, Engelmann, Whipple's Rep., vi., 250) is one of the largest and commonest Oak-trees of the south-west, and is found scattered over all the mountain ranges south of the Colorado plateau above elevations of about five thousand feet; it has oblong or obovate, entire or irregularly dentate, mostly cordate, narrow leaves, strongly reticulate on the lower surface, which, like the branches, is covered with yellow pubescence. The leaves vary much in width. Last spring I found at Fort Huachuca, in Arizona, trees of this Oak mostly covered with leaves of the ordinary form which bore individual leaves on fertile branches that were broadly obovate, and not distinguishable in shape and size from those of *Quercus reticulata*, a species with long-stalked, spicate fruit, of which, at first sight, this tree might be considered an extreme form, especially as its leaves resemble those of that species in their pubescent covering and prominent reticulate veinlets, but these trees differ in the character of the bark, in the length of the peduncles, which on *Quercus reticulata* are often five or six inches long, in the size and shape of the fruit, in the thickness of the cup-scales and in the cotyledons; these are purple and very astringent in both species, but in the former are united into a solid mass like those of *Quercus oblongifolia* and of the Live Oak of the southern states. As this species is without a name, I propose to call it *Quercus Arizonica*,† as it is

* *Quercus Toumeyi*, n. sp. Leaves ovate or ovate-oblong, rounded or cordate at the base, acute and apiculate at the apex, entire or remotely spinose-dentate, reticulate-venulose, persistent. Flowers unknown. Fruit sessile; nut oval or ovate, acute, glabrous on the inner surface; abortive ovules basal; cup thin, shallow, cup-shaped or turbinate, the scales ovate, thin, regularly and closely imbricated, tomentose on the back, produced into short free tips rounded at the broad apex.

† *Quercus Arizonica*.

Quercus Emoryi, Watson, Wheeler's Rep., 17 (not Torrey) (1874).

Quercus undulata, var. *grisea*, Engelmann, Rothrock Wheeler's Rep., vi., 250 (not *Quercus grisea*, Liebmamn) (1878).—Greene, Western American Oaks, 50 (in part), t. 14. *Quercus grisea*, Sargent, Forest Trees N. Am., Tenth Census U. S., ix., 144 (excl. syn.) (not Liebmamn) (1884).

one of the largest and most abundant trees in the southern part of Arizona, where it was discovered in 1871 by the party of United States explorers under command of Lieutenant George M. Whipple. *Quercus reticulata* in Arizona and New Mexico is confined to the summits and high cañons of a few of the highest mountain ranges, where, as a low shrub or small tree, it leads a precarious existence, while *Quercus Arizonica* is a large tree, the trunk sometimes four feet in diameter, growing from the upper margin of the mesas to the mountain-tops. In characters it is nearly intermediate between *Quercus reticulata* and *Quercus oblongifolia*, resembling the latter in its purple connate cotyledons, but differing from it in its thicker bark, pubescent branchlets, thicker, rigid, pubescent, oblong leaves, in its larger fruit and thicker cup-scales. It is a tree, too, of higher elevations than *Quercus oblongifolia*, which rarely ascends above five thousand feet, covering, with *Quercus Emoryi*, the upper part of the mesas, especially where mountain cañons open to the plain, and below the principal growth of *Quercus Arizonica*.

QUERCUS DUMOSA.—Of all North American Oaks this species of California is the most variable in the shape of its leaves. The ordinary form of the coast-ranges in the southern part of the state is a low shrub with oblong leaves, rounded or acute at the apex, with sinuate or spinose-toothed or entire, or slightly lobed margins, and usually about three-quarters of an inch long and half an inch wide, with short petioles and coarsely reticulate veinlets; but in sheltered cañons, on some of the islands off the California coast, a few individual plants attain the size and habit of trees, and produce large, deeply lobed leaves not very unlike those of the eastern White Oak. This is the *Quercus MacDonaldii* of Greene; and no one, from the mere examination of herbarium specimens taken from one of these trees, could imagine that they belonged to *Quercus dumosa*. When the trees are seen in their native thickets, however, it becomes apparent that they are only more vigorous individuals of a species which is represented in the same thicket by individuals with small and entire or spinescent or slightly lobed leaves. In these island cañons the same individual bears entire, spinescent, or rarely lobed, large or small leaves on the same or on different branches; and vigorous shoots on plants with otherwise small entire or spinescent leaves often produce large deeply lobed leaves five or six inches long. Seen from a little distance these large-leaved individuals cannot be distinguished by their habit, color and general appearance from their associates. North of San Francisco Bay the prevailing form of *Quercus dumosa* is distinguished by its rounder, thicker and paler leaves, which are concave on the upper, and strongly revolute on the lower, surface, with entire or spinescent margins. This very distinct variety was called by Engelmann *Quercus dumosa*, var. *bullata*, but as *bullata* had been used before as a varietal name of another species of *Quercus*, I shall substitute for it *revoluta*, and call this variety *Quercus dumosa*, var. *revoluta*.

QUERCUS DURANDII.—This White Oak of central Alabama and Mississippi, of central and western Texas and northeastern Mexico, was discovered in 1850 in western Texas by the botanists of the United States and Mexican Boundary Survey, and was first described by Torrey in the botanical report of the commission, published in 1858, as *Quercus obtusifolia*, var. *brevilobata*. The next year it was found by Mr. S. B. Buckley in central Alabama, and in 1860 was described by him in the Proceedings of the Philadelphia Academy as *Quercus Durandii*, but Torrey's name is older than Buckley's, and so will have to be adopted, and as *Quercus obtusifolia* (perhaps a misprint for *obtusiloba*) had been used before Torrey applied it to this species, Torrey's varietal name is taken up, and this handsome and distinct southern White Oak will appear in *The Silva of North America* as *Quercus brevilobata*, a name which, fortunately, pretty accurately describes the form of its leaves.

QUERCUS MUEHLENBERGII.—The oldest varietal name of this species, *Quercus Prinus acuminata* of Michaux, pub-

lished in 1801, was passed over by Engelmann when he raised this variety to a species because there was a *Quercus acuminata* published by Roxburgh in 1832. Michaux's varietal name, however, being older than Roxburgh's specific name, it must be taken up under the rules of nomenclature adopted by American botanists. *Quercus nana* must replace *Quercus ilicifolia*, which was first described by Humphrey Marshall in 1785 as *Quercus rubra nana*, a fact pointed out as long ago as 1801 by Willdenow & Muehlenberg in their paper on American Oaks in the third volume of the *Neue Schriften Gesell. Nat. Fr. Berlin*. And finally, in raising Chapman's *Quercus obtusifolia*, var. *parvifolia*, from western Florida, to the rank of a species, I find that *parvifolia* was used a year earlier by Alphonse de Candolle as the name of a variety of another Oak, so it is not available for this species, which I wish to call *Quercus Chapmani*, in honor of the author of *The Flora of the Southern United States*, who first distinguished it.

C. S. S.

Foreign Correspondence.

London Letter.

THE WEATHER.—Severe frost has been experienced in England since January 23d. The temperature at Kew has been below freezing-point since the 25th—that is, for three weeks, and from February 6th to 13th the minimum temperature on the ground ranged from seven degrees to zero, the maximum in the screen in the same period ranging from twenty-three to thirty degrees. This is very exceptional, nothing approaching it having been known here since the time of the Crimean war (1856). The Thames is frozen over at Kingston; a coach and four have been driven across the Serpentine in Hyde Park; there is a water famine in many districts in consequence of the freezing of the water-mains, the frost having penetrated into the ground to a depth of two feet. Following an exceptionally mild November and December this severe cold is certain to do an enormous amount of injury to garden-plants. The rise in the price of vegetables, including potatoes, has been great, and it is probable that garden produce generally will be at a high premium when the thaw comes.

THE ROYAL HORTICULTURAL SOCIETY held its annual general meeting on February 12th. Sir Trevor Lawrence, the President, drew attention to the principal features in the report, which records, among other things, that twenty-two exhibitions had been held; that one hundred and seventy-eight first-class certificates and three hundred and seventy-one awards of merit had been adjudged by the several committees to as many plants, fruits and vegetables; that the experimental and trial work in the garden at Chiswick, under the superintendence of Mr. Barron, had been of an important character, many new varieties of Cauliflowers, Peas, Potatoes, Tomatoes and Strawberries having been cultivated and examined by experts; also of Carnations, Picotees, Cannas, Clematis, Campanulas and other popular garden flowers. The examination in the principles and practice of horticulture, held on May 1st, had resulted in 126 candidates presenting themselves, nearly one hundred of whom passed, two having won scholarships worth £39 a year each.

A committee has been appointed to draw up a code of rules and regulations for judging at fruit and flower shows. The Scientific Committee, composed of eminent men of science, invite all interested in horticulture to submit to them cases of diseased, injured or abnormal plants of all kinds, and offer to give advice in respect to the prevention or cure of disease. The income of the society for 1894 amounted to £5,550, and the expenditure to a little over £5,000. The present condition of the society is on the whole most satisfactory. The want of a suitable home and exhibition hall for the society is still felt, and the further development of Chiswick as a representative school of horticulture and experimental ground for English horticulture is generally hoped for by those who know the value

such an establishment would have in the promotion of horticulture. Botany and scientific gardening are looked after at Kew, but there is much need of a national fruit and vegetable garden such as Chiswick might be.

PHALÆNOPSIS YOUNGIANUM.—A fine spike of flowers of this handsome, large-flowered Orchid was shown on Tuesday by Baron Schröder, and was awarded a first-class certificate. It is said to be a natural hybrid between *Phalænopsis Aphrodite* (*amabilis*) and *P. Stuartiana*, Messrs. Veitch & Sons having imported it accidentally a year or so ago among a batch of the last-named species. The spike shown by Baron Schröder bore ten flowers, each nearly three inches across, or as large and full as a good form of *P. Aphrodite* (*amabilis*), the color being blush-white, with the lower sepals and front lobe of the lip spotted with red-brown, and the side lobes of the lip striped with crimson. It was first flowered in February last year by a Mr. G. Young, and then obtained an award of merit.

PHALÆNOPSIS INTERMEDIA PORTEI.—The largest flower-spike

being wholly of a deep, glowing maroon-crimson, the lip darker than the rest of the flower. This is an *Orchid* of quite exceptional merit, *Calanthes* of this section being as easy to grow and flower as any *Orchids*, and they flower at a time when they are especially valuable. We have many good varieties and hybrids among *Calanthes* now, but this is much better than any of them. There is something to be said in favor of hybridizing *Orchids* when a plant like this *Calanthe* is the outcome.

CYMBIDIUM EBURNET-LOWIANUM var. *SUPERBUM*.—This is an improvement on the hybrid whose parents are indicated in the name, and which was raised and flowered by Messrs. Veitch & Sons in 1889. The variety has larger, better-formed flowers, which are also clearer in color, being cream-yellow flushed with rose, with a blotch of crimson on the front lobe of the lip. The habit of the plant and form of the flowers resemble *C. eburneum*. The plant which was shown by Messrs. Veitch & Sons on Tuesday last had a spike eighteen inches long, bearing four flowers,

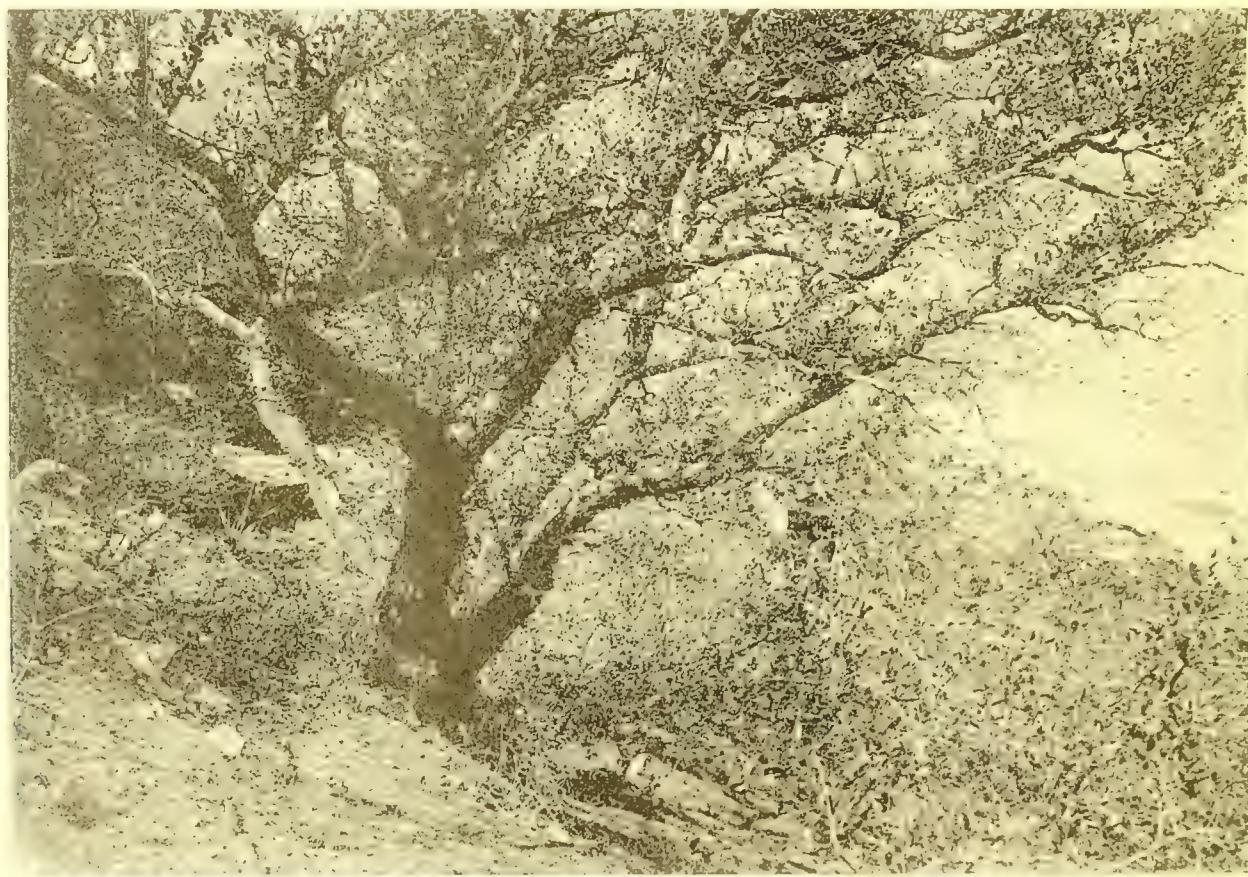


Fig. 13.—*Quercus Toumeyi*, n. sp.—See page 92.

I have ever seen of this plant was shown last Tuesday by Lord Rothschild Tring, and obtained a first-class certificate. It was two feet long, with five branches each, from six to nine inches long, and it bore forty flowers each about two inches in diameter and colored white, with a tinge of purple at the base of each segment, the lip being yellow, amethyst-purple and red. This variety was introduced in 1861 by a Frenchman named Porte, and first flowered in the collection of Messrs. H. Low & Co. It is the best of the several forms known of *P. intermedia*.

CALANTHE BARON SCHREDER is the most beautiful of all *Calanthes*. I noted it in one of my letters about this time last year, when it was shown by Baron Schröder, in whose garden it had been raised from *C. vestita oculata*, crossed with *C. Regnieri*, and it obtained a first-class certificate. The baron showed a flower-spike of it again last Tuesday; it was three feet in length, carried twenty-five perfect flowers, each two inches across, in form equal to the very best of *C. vestita*, and in color absolutely beyond comparison,

each four inches across. It was awarded a first-class certificate. Mr. Veitch informed me that this variety was raised from seeds out of the same pod as produced the type flowered in 1889. The latter I called poorer than either parent, but the variety is a good acquisition.

ODONTOGLOSSUM CORONARIUM is a noble *Orchid*, but somewhat difficult to flower. Last Tuesday two large flower-spikes of it were shown, one from the garden of Sir Trevor Lawrence, the other from Baron Schröder. The latter bore twenty-five flowers and was deservedly awarded cultural commendation. The plant thrives in the coolest and moistest house, and it appears to delight in as much moisture at the roots as a *Disa*. It has a stout, long rhizome, bearing large ovoid pseudo-bulbs three inches or more apart, and leathery leaves ten inches long. The spike is erect, about a foot long and generally crowded with flowers, as in a *Hyacinth*. Each flower is two inches across, with equal spreading oblong fleshy segments colored coppery red, with a yellow margin and a few yellow spots at the base, the lip being

wholly yellow, except at the base. The whole surface of the flower shines as if it had been coated with varnish. It should be planted in sphagnum and peat in a shallow teak basket or raft and suspended near the roof glass in a shady position in the cool house.

HYBRID CYPRIPEDIUMS.—A list, presumably complete up to

may see fit to grumble at the creation of such a host of what I call pedigree Orchids, and however poor we may vote many of them to be as decorative plants, they continue to excite a considerable amount of interest among a section, at any rate, of Orchid growers, for whom Mr. Chapman's list will have great value. Viewed as a record of work done by the hybridist, this list in itself is astonishing, while in the extreme divergence of character in the parents of some of the hybrids raised the systematic botanist has food for reflection.

FLOWER DRYING.—A collection of dried flowers of Orchids was an interesting exhibit last Tuesday. They had been prepared by Mr. Chapman, gardener to Mr. Measures, and they comprised Cypripediums, Cattleyas, Sophronitis, Lælias and similar popular brightly colored Orchids. The merit of the exhibit lay in the wonderful preservation of the colors, which were quite as brilliant as when the flowers were alive and looked, a short distance off, like accurately colored drawings. Mr. Chapman succeeds in preserving the colors by putting the flowers between sheets of blotting paper under sufficient pressure to prevent them from shriveling, and then placing them in a hot oven. The flowers thus treated are thoroughly dried in a few hours without any loss of color. When mounted on paper and exposed to light and air the colors in time lose a little of their brilliancy, but flowers that had been done a year had not appreciably faded. The difficulty is to fix the colors so that they will not fade. Mr. Chapman's method is likely to be of greater value to horticulturists than botanists.

INTERCHANGE OF SEEDS.—The botanical gardens of importance in Continental countries and the United Kingdom annually print and circulate each a catalogue of the seeds available for distribution from those ripened in the gardens, and also, in some cases, including surplus seeds obtained from tropical countries. These catalogues are, as a rule, posted to all botanical establishments so that selections can be made. In this way it is easy to replace losses among plants of botanical interest only, and especially of annuals and other easily lost plants which may fail to ripen in some gardens, but succeed in others. The custom is an excellent one. I know that at Kew it is found to be of considerable help toward maintaining the collections, and also that Kew contributes largely to the maintenance of collections in other gardens, as is shown by the fact that the number of packets of seeds ripened at Kew and distributed last year amounted to 5,200. This does not include the seeds received at Kew and redistributed to the colonies, etc. Is there such an interchange of seeds among the botanical gardens of the United States?

London.

W. Watson.



Fig. 14.—*Quercus Toumeyi*, n. sp.—See page 92.

1. A fruiting branch, natural size. 2. Cup-scales, enlarged. 3. A nut, natural size.
4. A seed, natural size. 5. Leaves, natural size.

the time of publication, of all hybrid Cypripediums, has been drawn up by Mr. H. J. Chapman, gardener to Mr. R. I. Measures, of Camberwell, whose collection of Cypripediums is the largest known. Mr. Chapman's list is published in *The Gardeners' Chronicle* this week. It comprises no less than five hundred and twenty-two hybrids. The parents in each case are given, and also the raiser's name. It must be acknowledged that however much some of us

Plant Notes.

HOUSTONIA CÖRULEA.—This charming, although diminutive, native plant is rarely cultivated, although not at all difficult to propagate and preserve. Where it is not indigenous, it is always an attractive novelty when in flower, and where it does grow wild it might profitably receive more attention than it generally gets. Where the plants grow

naturally they can be transplanted into gardens, frames or pots, and with ordinary care they will continue to thrive year after year. They will grow well in almost any good soil, one composed of sand and loam being apparently most congenial, and they luxuriate where they get plenty of moisture in the growing season, but are not too wet. They may often be found in great profusion on rocky hills near the seashore, where there is very little soil, but plenty of moisture from frequent mists or fogs, and where few larger plants get a foothold and overshade them. When potted and kept in a cold frame they can be forced into a profusion of bloom in midwinter, when the delicate beauty of the flowers is happily displayed above a low, close mat of green foliage. The flowering stems are rarely more than three or four inches long, and bear tiny yellow-centred, four-petaled flowers, which vary from almost pure white to a rosy lilac or light blue on different individuals. To the botanist these blossoms possess a peculiar interest on account of the fact that they are dimorphous, being of two forms of structure, some flowers having protruding stamens and short styles, and others having the stamens included within the tubes, while the styles are long and the stigmas exserted. This little Houstonia, sometimes called Bluets and Innocence, among other local popular names, being a perennial, will in time form quite a broad tuft by spreading from a single stem by slender thread-like root-stocks or creeping stems. The plants can be propagated by seeds or by division of the delicate masses of roots, which must then be carefully grown until they again form good independent tufts.

Nymphaea O'MARANA.—This is a hybrid between *Nymphaea dentata* and *N. Sturtevantii*, raised by Mr. Peter Bisset, gardener to G. G. Hubbard, Esq., Twin Oaks, Washington, D. C., and now in flower in the glass-covered tank of Mr. John McElvery, which was described in our issue for January 9th. Indeed, it has been blooming every day since early in September, and it is constantly showing new buds, being more floriferous than *N. Devoniensis* at this season, and not excelled by any Water-lily in persistent and continuous bloom. This is particularly remarkable from the fact that the plant is growing in a pot only ten inches in diameter. After having passed through the shortest days of the year it seems now as vigorous as most *Nymphaeas* do in July. Its large metallic green leaves resemble those of *N. dentata*, being strongly toothed at the margin, but they have a wider cleft. The full flowers are shaped like those of the same parent, are borne on stout petioles which lift them well above the water, and they measure eight or nine inches across. The color is a beautiful glowing pink, without any of the shading of magenta which is seen in *N. Devonensis*. The stamens are of an orange color, with the marked incurved form which shows the blood of *N. Sturtevantii*, and they tint the petals with a beautiful reflection. The flower is rather lighter than that of *N. Sturtevantii*, but, unlike most other pink Water-lilies, they grow darker with age, instead of fading out.

BEGONIAS PRESIDENT CARNOT and *B. FRANÇOIS GAULIN* are among the showiest and most effective winter-blooming shrubby Begonias. They are French hybrids produced by Monsieur Crozy, and are crosses of *B. rubra* with probably *B. Olbia*. They resemble *B. rubra* in habit, well-grown plants forming strong, straight shoots with flowering side branches. The foliage is distinct from either of the parent species, being oblique, smooth-veined, large, light green above, and sometimes suffused with red below and on the edges. The plants produce freely well-furnished racemes of large flowers, some two inches long, and mostly female. There is a difference in the coloring of the two hybrids, the latter being the lightest. The coloring is not as pure in tone as that of *B. rubra*, having a somewhat bluish cast in the pink of its flowers. Plants are easily propagated, and cuttings struck now will make strong plants for next winter. *B. François Gaulin* was figured in *GARDEN AND FOREST* (vol. vi., page 123), but the raceme there shown was smaller than those on well-grown plants.

BOMAREA CARDERI.—*Bomareas* are somewhat rare plants in this country, although they were grown in English gardens nearly twenty years ago, and have been known more than fifty years in botanical collections. They belong to the Amaryllidæ, being closely related to the Alstroemerias, but they have long, slender, twining stems with bright green leaves, and bear flowers in terminal umbels. A plant of *B. Carderi* in a private house near this city is now in bloom, and, indeed, it has been in bloom since midsummer, and its flowers are almost as large as those of a *Lapageria*. The color of the flower is a rich rose, with conspicuous brown spots near the tips of the outer segment, and larger purplish spots on the inner segments, which are greenish white. In large plants the umbel will contain forty of these flowers, and will measure as much as two feet or two and a half feet across. The roots produce fleshy tubers, but they have no buds, and, therefore, are not useful in propagation. They are multiplied by the means of seeds or by dividing the root-stalks in the spring. They seem to do best in a well-drained border in a warm sunny greenhouse. The stems of *B. Carderi* often grow to a length of ten or twelve feet, and being covered with broad, ovate, bright green leaves, they are striking plants, and commend themselves as suitable for every considerable greenhouse collection.

Cultural Department.

Grapes in North-eastern Vermont.

IT was in 1867 that I planted my first Grape-vines on the shore of Lake Memphremagog; the first, I think, that were ever planted there. Hartford Prolific was the variety, and the only one I had any hope of even partially ripening. It is the shortness of the season alone which forbids grape-growing in this locality. Otherwise, it is an ideal spot for the purpose. Fog is unknown, and dull days unfrequent; but frost comes in September, and it sometimes does not wait many days after the end of August. There are exceptional years, perhaps one in six, when frost holds off much longer; but the Grape we want is one which will be ready to cut by the tenth of September.

The orchard on my old place, but a few rods from the east shore of the lake, is very well protected from light frosts; but until near the first of June, and sometimes as late as the tenth, we are liable to have a killing frost. This, however, is not common, having occurred but thrice in twenty-five years. My Grape-vines are on a light trellis, in front of a high and tight fence, eight hundred feet long and facing south; stakes are also used, and the summer pruning is less severe than is usual in commercial vineyards, as I am not growing for market; and handsome clusters not being imperative, while protection from frost or chill is, I do but a moderate amount of pinching. The result is, not so many handsome clusters, but more ripe ones.

As to varieties, I have invested in every new early sort as it has come out, so that I have a much larger assortment than I should plant if I were to begin afresh. Hartford Prolific has been quite discarded, not only for shelling, but because it is too poor in quality. Eumelau has also been dropped, though only lately, to give place to more promising sorts. In fact, none of Dr. Grant's seedlings have proved very useful. Salem is the only one of the Rogers hybrids. It ripens so as to be eatable in about half the seasons. Isabella is too late, though it has sometimes ripened quite nicely. Delaware gets fairly sweet in most years, and is regarded as the best of the older sorts. In a hot summer Brighton ripens perfectly; but in a steadily cool one it will not ripen at all, while the vine is very apt to die after such a season. Moore's Early colors, but very rarely gets sweet. It is, however, a good culinary sort, especially for jelly.

I had got pretty fully convinced that this was as far as we should ever get in grape-growing in northern Vermont, when, at the meeting of the American Pomological Society at Boston, in 1887, my eyes lighted upon specimens of the "Green Mountain," dead ripe, when not a single other variety on exhibition was eatable. Here was a grape which I felt sure would ripen every year on Lake Memphremagog; and it does so. Since then I have fruited the Diamond, and find that it is but very little behind the Green Mountain in season; while I cannot see why it will not prove a good commercial variety, which Green Mountain never can be, on account of the feeble adhe-

sion of the fruit to the stem. After such successes I am beginning to think that even in the cold north we may be able to make commercial grape-growing at least moderately successful. It is most gratifying, after so much failure, and with so little expectation or reason for hope, that such a measure of success has been reached. And we may do better yet, for the Wild Grape is native here, draping the trees by the river banks. The name first of all given to New England points to a future when it will be truly a land of Vines.

Newport, Vt.

T. H. Hoskins.

Cinerarias.

LIKE many other old-time favorites, these flowers have been left somewhat in the background, although few, if any, greenhouse plants supply us with such a variety and brilliancy of color. In England they are more largely grown, and every year witnesses some improvement in Cinerarias, either in habit of growth, form of flower, or variety of color. The cooler English climate during the growing season is more suitable to the growth of these plants than ours, and this may partially account for their greater popularity across the sea. They can sow seed much earlier, and this allows a longer season of growth, with firmer, more mature and more stocky plants. Still, we have the advantage of brighter weather and a drier atmosphere during the winter months, and with a little study of the required temperature there is no reason why we should not grow them equally as well. The first of August is early enough to sow the seeds; they germinate readily with ordinary care and should be pricked out into boxes as soon as they are fit to handle. A cold frame facing north, with slight shade from strong sunlight, will be found most suitable for them at this stage, and they should be potted on as they attain size, first into three-inch pots, and finally into eight-inch pots, a light but moderately rich soil being used all along. A plentiful supply of water, but no stagnation, is essential. The most troublesome insect enemy is green fly, which can be destroyed either by smoking, dusting with tobacco powder, or dipping in a weak solution of any ordinary insecticide. For winter quarters a house where they can be kept well up to the glass, and where a temperature of sixty degrees by day and forty degrees by night can be maintained, will suit them well. All flower-buds should be pinched off as they appear until about the first of January, after which time pinching should be discontinued, and this will bring them in good time for Easter. When the pots are well-filled with roots they will be greatly benefited by occasional applications of liquid-manure. Nothing is more suitable for this purpose than water from the cow-sheds, which, however, should be well diluted.

William Scott.

Tarrytown, N. Y.

Nelumbiums.

THE Nelumbiums have no rivals among aquatic plants for stateliness, and they can be used not only in the large lakes and water-basins of public and private parks, but they have a refined character which makes them appropriate even for small water-gardens. They are so perfectly hardy that it is difficult to understand the frequent complaints that they are difficult to grow and establish. One cause of failure may be that they are planted too early. Planting should be delayed until warm weather and genial conditions set in, so that the tubers or plants will make active growth at once. When tubers are received from a distance they may have been subjected to a warm temperature in shipment, and, therefore, the chill of a plunge in cold water may check their vital energies. Where the tubers have made young rootlets it is much safer to plant them in shallow boxes and keep them protected either in a cool greenhouse, pit or frame until it is safe to place them in permanent quarters. By all means avoid the check to growth, which always means weakness, if not actual death, to the plants.

Another good plan is to place such roots in large pots or pans and keep them growing until warm weather, when the plants can be turned out with a good ball of soil and roots and carefully deposited where they are to bloom. Where there are no tanks for the reception of large pots, tubs can be used. Another method is to start seeds. Of all seeds none germinate more readily than those of Nelumbiums, provided the hard shell is filed through at the base of the seed so that water can penetrate. The plumule escapes first, sometimes two or three days before a rootlet is visible, and always from the base; therefore, by filing at this particular spot much assistance is given to the young seedlings. In a temperature of seventy-five degrees the seed will germinate in about six days, sometimes less. The seeds may be placed singly in small

pots, or may be started in water and potted afterward; in either case the young plants must be grown and established in large pots or pans before planting permanently. Nelumbiums will not flower the first year as seedlings, but will, in most cases, do so the second or the following year. Apart from their flowers, the Nelumbiums are highly ornamental plants and worthy of cultivation for their foliage alone.

Clifton, N. J.

W. Tricker.

[Two seeds of *Nelumbium* were placed in a small bottle of water and set on a desk in this office, and they germinated within a week.—ED.]

A Few Annuals.

THERE seems to be a perennial demand for information about annuals, not only from beginners in gardening, but from those who are more or less familiar with flowers, but do not care to experiment—persons content to wait till they find a good thing mentioned. Last year I made full notes of the more important annuals and a few other useful flowers which can be readily grown from seed in one season. It may be of some use now to furnish notes of other annuals which may be considered of secondary interest. By secondary interest I mean not that these flowers are less beautiful than the first mentioned, but they are not those one would usually select for a limited list. Often they are perfect as border flowers, but lack either the stability or grace of form which is required in flowers useful for cutting. For instance, nothing is more beautiful in a large border than a mass of the *Eschscholtzia*, with its finely cut glaucous leaves and its brilliant yellow flowers of various shades, borne so freely, yet it may be considered of secondary importance, as these flowers are quite fugacious. It must be, of course, understood that, in recommending, one is influenced more or less by his prejudices or feelings. A writer in *GARDEN AND FOREST* lately suggested that I was influenced in the choice of varieties of a flower by sentiment. The accusation was partly correct, and I am convinced that if an amateur does not grow plants and sentiment in his garden in about equal proportion he is not getting the full benefit of his labor. The most satisfactory flowers are those, however common, from which one gains inspirations of beauty and to which some pleasant associations are attached.

As for the cultivation of these quick-flowering plants, we are apt to plant the seeds too early, either in the greenhouse, or, lacking this, in some spare corner of the dwelling, and in either place they become a burden and are never as strong and vigorous as those grown with more air and exposure. In gardens managed in a comfortable, leisurely way, and well furnished with a good assortment of plants, the planting of seeds of annual flowers may be delayed till they can be sown in an outside frame, where they will progress without check and make strong plants, quite early enough. When the night temperature ranges about 50 degrees, F., is the proper time. This will usually be toward the end of April here. In this procedure we have the spring-sown annuals commencing to flower just after the June Roses. In the early year we have flowers in abundance from the bulbs, the flowering shrubs, and the early-flowering herbaceous plants. The fall-sown Poppies and *Centaureas* will cover the ripening foliage of the bulbs and lead the flowering of those annuals which will naturally fill the gap as the hardy Roses pass away. It is difficult to forward many of the annuals much, and the trouble of early care under shelter is scarcely warranted.

The list of annuals, or plants to be treated as such, given last year, included as most usually desirable China Aster, *Calliopsis*, *Calendulas*, Marguerite Carnations, *Cosmos*, *Centaureas*, *Chrysanthemum coronarium*, Indian Pinks, *Gaillardias*, Sunflowers, African and French Marigolds, *Mignonette*, *Nasturtiums*, *Pansies*, Poppies, Sweet Peas, *Torenia* and *Zinnias*.

This list takes no account of vines and a number of hardy annuals, many of which are interesting and worth growing. Among the many remaining annuals of the seed lists, not climbers, the following seem the most desirable: Sweet Alyssum, Balsams, Candytuft, *Eschscholtzias*, Swan River Daisies, Chrysanthemums (single annual), Larkspurs, Marvel of Peru, *Nicotiana affinis*, Petunias, *Phlox Drummondii*, *Portulaca*, *Salpiglossis*, *Spheroxyne*, Stocks, *Venidium Calendulaceum*.

This list, it will be seen, includes some of the most important items of the seedsmen's stock and some flowers considered indispensable by many growers, but the two lists are offered as a fair guide to those whose experience is, perhaps, a blank. These plants are so familiar in old gardens that the seedsman usually dismisses them with a few lines. I hope to add a little to the perspective by briefly noting their beauties and shortcomings, with a slight account of the climbers.

Elizabeth, N. J.

J. N. Gerard.

Correspondence.

The Cultivation of Tea in America.

To the Editor of GARDEN AND FOREST:

Sir.—In Mr. Watson's London letter, in your issue of January 16th, I notice some remarks on Tea cultivation which might induce American planters to think that the plant could be profitably cultivated in the southern states. It will, no doubt, grow there and may produce tea of fair quality, but unless labor can be had at an almost nominal rate it cannot compete in price with tea from India, Ceylon and China. A great deal of the manufacturing process is now done in India and Ceylon by machinery at a low cost, but hoeing and picking must be done by hand, and as in Sikkim we pay coolies at the rate of from four to seven rupees a month, without food, which is equal at the present rate of exchange to from one to two dollars a month, and have virgin soil of the greatest fertility, in a most forcing climate, at a trifling cost, we have advantages in India which seem to me to make competition in other countries impossible. Statistics show that the proportion of China tea now used in England has steadily fallen, notwithstanding its very low price. The average price of Indian tea in Calcutta on January 24th was nine annas, equal to about fifteen cents a pound; and though this includes much tea of low quality, yet an average of ten annas is a very profitable price for the total output on many plantations, and some pay fairly with an average price of only six annas.

I was much surprised when in America to find how little known Indian Tea is there, and how few people really know the taste of good tea. If it were understood that almost every leaf of Chinese tea is contaminated by perspiration, owing to the system of rolling by hand still followed there, while Indian tea is now almost everywhere rolled by machinery, I feel sure more people would drink the India product. Adulteration is absolutely unknown in India, while much China and Japan tea is artificially colored. Of the various sorts of Indian tea, Darjeeling is the finest for drinking unmixed. Assam and Cachar tea is stronger, and the best of it too astringent for many palates. Ceylon is good cheap tea, but rarely has the delicate aroma of Darjeeling, Pekoe or Broken Pekoe. The presence of a number of the young unopened leaf-buds, technically called tips, in Indian Tea, is always a sign of good quality, and in the finest qualities of Darjeeling tea there is a delicate after-taste of chocolate, more easily perceived when the tea is drunk half cold. Weak cold tea is about the best and most refreshing drink I know in hot, dry climates, and much less heating than coffee, which is also more difficult to make properly.

Cheltenham, England.

H. J. Elwes.

Flowering House-plants for Early Winter.

To the Editor of GARDEN AND FOREST:

Sir.—Owing to certain mischances, the last autumn found us with only a few large plants for winter display, and these were mostly so-called foliage plants. We wanted something bright in the way of flowers during November and December. We had quantities of potted plants, but their lack of size and dignity emphasized the need of something with more character and distinction. Later on we could have Azaleas, Lilies, Genistas and Holland bulbs, but for these two months we had no decorative flowering plants except Chrysanthemums. In early autumn we had a three-days' rain that soaked the beds to the bottom, and as frost approached I thought of the bright Salviyas and royal Dahlias that would soon be frozen and blackened. Why not try these for window-plants? One deep stroke with mattock behind the ball of roots, then one on each side, then a deft understroke and a steady leverage from the mattock, and Salviyas three feet in diameter, Celosias with heads sixteen inches long, clumps of Crozy Cannas and great bushes of Cosmos came up with huge balls of earth unbroken. Placed in tubs the lifted plants were shaded for a day or two, but this precaution seemed unnecessary. Not a leaf withered or a flower drooped. The gorgeous Cockscombs and flaming spikes of Salvia made a bright display for three months, while the smaller and later plants had a chance to do their growing and make ready to take their place later on.

These garden-grown plants had double the bulk and weight of roots that would have been made by a pot-grown plant. But to offset this disadvantage they had an exuberance quite unusual to indoor plants, and, altogether, the experiment was so successful that I shall certainly try it another year.

Pineville, Mo.

Lora S. La Mance.

Notes from Wellesley, Massachusetts, and its Vicinity.

To the Editor of GARDEN AND FOREST:

Sir.—On the occasion of a late visit to Mr. Joseph Tailby, of Wellesley, noted as the introducer of Grace Wilder and other good Carnations, we found that the Mrs. Fisher, as grown here, is superb. The centre bed of one long house, planted with this variety, was a sheet of snowy bloom, and the individual flowers showed little of the tendency to burst their calyces, an objection which is sometimes urged against this plant when it is grown in the winter, and there can be no doubt that where it does well it is still the leading white Carnation. Mr. Tailby's plants are the best I ever saw, and worthy of a long journey to see. Of the seedlings here, Henrietta Sargent, the new yellow, and Helen Schaffer, white, are two of the best. William Scott is the leading pink variety, but Ada Byron appears to be a failure.

A small bench of the new Farquhar Violet looked promising, while Lady Hume Campbell and other standard varieties were recovering from an attack of leaf curl and flowering finely. At the Wellesley College greenhouses two beautiful specimens of *Acacia pubescens*, with stems seven feet long, were in flower, and their drooping branches, thickly hung with racemes of sulphur-colored flowers, testify to what was said in a recent number of GARDEN AND FOREST as to the value of this Acacia for winter flowering. There are few Orchids here, but all are well grown, and two plants of *Dendrobium nobile* were seen which can hardly be duplicated elsewhere in the United States. One of these specimens usually finds its way to the spring exhibition of the Massachusetts Horticultural Society, and is always a centre of attraction there. The twin plants are now carrying from six hundred to a thousand buds each. The sweet-scented *Pilumna nobilis* and *Angraecum superbum* were both nicely in bloom, and a fine lot of *Odontoglossum* were very interesting. At Mr. Hunnewell's place the plant of *Clematis indivisa*, which has been described in your columns, covers a large part of the roof of one of the cool houses, and it is now a picture, thousands of its beautiful white flowers being fully expanded. For covering pillars and training thinly over the roof of a greenhouse, nothing is more desirable than this plant. It will flower freely in a six or eight-inch pot, but to see it in perfection it should have the treatment which Mr. Harris gives it here, where it is planted out and occasionally root-pruned to keep it within bounds. I noticed fine flowers of *Phalaenopsis* in the warm Orchid house, but most of the Cattleyas, Dendrobiums and other Orchids are held back so that they can flower with the Rhododendrons, at which season Wellesley is at its brightest. At Mr. Walter Hunnewell's I observed a fine display of the best winter-flowering Begonias, and was interested in Mr. Hatfield's specimen *Chrysanthemum* plants, which were already in four-inch pots. Here the Violet, Lady Hume Campbell, looked clean and healthy and was behaving properly, as it was at Mr. Arthur Hunnewell's place.

At Mrs. B. P. Cheney's, South Natick, Mr. John Barr, the head-gardener, showed me a Rose house which contained flowering plants of Madame de Watteville, Catharine Mermet, Bride, Bridesmaid and Perle de Jardin, which were as good as can be seen anywhere. Cyclamen here in ten and twelve inch pots, Cinerarias and Carnations are all capitally done. In the graperies I observed by the mulching on the border that the vines here received generous treatment, and it is worth stating that in too many places the failure of fruit is owing to starvation, the vines neither receiving a proper amount of food or of drink. At the greenhouses of Mr. David Nevins, in South Framingham, I saw those remarkable Violets which have made such a sensation at two recent exhibitions in Boston. The average flowers were as large as a half-dollar, and exceptional ones will cover a silver dollar comfortably. The variety chiefly grown is Marie Louise, but Swanley White is equally good. The plants are grown in eight-inch pots in a Carnation house temperature, and many of them show three dozen, and even more, fully expanded flowers, with any number more coming on and not a sign of spot or leaf curl. Mr. McKay, the grower of these remarkable flowers, pointed out a group from which he had picked a thousand flowers the day before and they could hardly be missed. Violets are not the only things done well here, as the hybrid Perpetual Roses and a few well-grown Orchids testify. The most successful Carnations here are Lizzie McGowan, Mrs. Fisher, Tidal Wave and Ferdinand Mangold. Below the benches, in the cool house, some beds were carrying a good crop of Mushrooms, as well as Rhubarb and Sea Kale.

A short walk from Mr. Nevins' estate brings us to Mr.

William Nicholson's establishment, in Framingham Centre. This is one of the best-known florists' places in the neighborhood of Boston. Carnations make the leading feature of the place, and all the standard kinds are grown in quantity. The new varieties, Nicholson and Ada Byron, while not successful with some growers, here make a splendid show, the plants being smothered with flowers and buds, borne on long stems. Other kinds specially well grown are Mrs. Fisher, Hector, F. Mangold, William Scott, Daybreak and E. G. Hill. The sale of rooted cuttings is here a specialty, and many thousands are now in the cutting-benches. Roses fill a house one hundred feet by twenty, and a similar-sized house is devoted to Tomatoes, the kind chiefly grown being Nicholson's Hybrid, the standard forcing variety for the Boston market, and raised some years ago by Mr. Nicholson.

Taunton, Mass.

W. N. Craig.

Meetings of Societies.

The American Carnation Society.—II.

THE display of cut flowers excelled in abundance, variety and general quality all previous exhibitions of the Carnation Society. Our report of the meeting concludes with some notes on the more promising seedlings, as well as the standard varieties in the leading classes and colors :

Something like seven thousand flowers, including seedlings, were staged at the exhibition, and two-fifths of these were different shades of pink. White flowers were next to the pink ones in number, and then scarlet, yellow, variegated and crimson followed in the order of abundance. Among the flowers of different shades of pink, William Scott had no peer, and in the classes for light pink flowers it captured nearly every prize. Larger flowers were shown of some varieties, such as Nicholson, but the stems were so weak that they hung over the edges of the vase, or else they had some other defect to counteract their superiority in size. Altogether, William Scott can be pronounced the best all-round pink Carnation in cultivation to-day; its superb color, good stem and healthy growth making it a success wherever tried. Next to William Scott, Daybreak was shown more largely than any other pink variety, and it was of very good quality. These two sorts are unquestionably the best of their color up to date. The old Tidal Wave, now seldom seen, was remarkably well shown by Dailedouze Brothers. The flowers were large, carried on stiff stems, and they looked fresh at the close of the exhibition, and their rich dark rose-color was unequaled, or, at least, unexcelled by any of the newer kinds. The best white was Storm King, as shown by Mr. C. W. Ward, of East Moriches, New York. It is a strong grower, with stout stems and large well-formed flowers. Alaska, with which Mr. H. E. Chitty, of Paterson, New Jersey, won the prize for the best vase of a hundred white flowers, is a cross between Puritan and Lizzie McGowan. It has a decidedly stouter stem than the latter parent and a flower of much the same form. The second prize in this same class was won by a seedling of Mr. Chitty's, which he calls No. 150. These were undoubtedly the finest flowers in the class, but they lacked strength, both of stem and calyx.

In the scarlet class, the new Jubilee, as exhibited by Mr. Hill, of Richmond, Indiana, was easily first. The color of the flower is a light scarlet, rather dull, and the petals are not fringed at all. It is very sweet-scented, too, which is rather unusual in a scarlet flower. The stems were remarkably strong, so that every individual flower stood erect, but the plant showed unmistakable signs of rust. Hector, which secured the second prize in this class, is a finely fringed large flower of a much brighter color than Jubilee, and if it had the stem of the latter it would be decidedly the better of the two. The Stuart was not largely shown. According to Mr. Dorner, who raised it, it is only seen at its best in a solid bed and kept under glass all the time. The new Meteor was quite the best of the few crimson sorts which were shown. In form of flower, stiffness of stem and strength of calyx this seems to be an acquisition. Jacqueminot was represented by one vase with remarkably strong stems, and although the flowers were smaller than those of Ferdinand Mangold, they were of a pure rich color, and the plant must be considered an acquisition to the crimson class.

Buttercup, which is very fickle in its behavior and has had to give place to Bouton d'Or, a beautiful lemon-yellow, and to the newer Dean Hole, was shown in admirable condition by Mr. Southworth, and if this old variety could always be grown in such form there is certainly no yellow equal to it. Helen Kel-

ler was shown by several growers in fine condition, and was far the best of the fancy marked flowers staged. Edwin Lonsdale's lot was superb in every respect, and the plants seem to succeed admirably throughout the Philadelphia district. Such flowers as these were never seen before in Boston. Minnie Cook, Mr. Chitty's new variegated variety, followed Helen Keller as the next best in its class, and it won the first premium for a vase of a hundred flowers.

Eighty new seedlings were shown, twenty-nine of which were pink, fifteen white, ten yellow, nine variegated, five crimson or scarlet, and the remainder some odd shades of color. These flowers were in many cases admirable, and showed a marked advance over the kinds now grown. Triumph, from Messrs. Hill & Co., was a specially noticeable pink flower with the best stems of any plant of its color, large, elegantly formed and a most pleasing shade. Among the dark pinks was Mr. May's Lena Saling, of which we have already spoken. It is somewhat lighter than Tidal Wave in color, with large flowers of a similar form and a perfect stem. Maud Dean, of a soft fawn color, paler than Daybreak, and shading to rose in the centre, Mr. Shelmire's Silver Queen and Mr. Hill's deep pink Arcadia were all good. Della Fox, described in last week's report, and commended because shown, not only as a cut flower, but also as a growing plant, was notable for the delicacy of its pink color. Besides Storm King and Alaska, of which we have spoken, Mr. Tailby showed a seedling called the Poor Man's Friend, with an immense flower, but rather tender calyx. Mr. Fisher showed Crystal, another large flower, but feeble in the stem. Of the new scarlets and crimsons there is no need to speak of any besides Meteor and Jubilee. Mr. May's Dean Hole is a fine bold yellow of first-rate habit, and Tailby's Henrietta Sargent had a clearer color than any other variety shown. Perhaps the best of the new variegated ones was Aramazinda, of Messrs. E. G. Hill & Co., who were the largest exhibitors of seedlings, and who staged twenty varieties, not one of which was ordinary. All the flowers were fine, the vigor and strength of their stems were noticeable, and at the close of the second day's exhibition nearly all of them seemed perfectly fresh, although they had been carried fifteen hundred miles, while most of the flowers from exhibitors in the neighborhood of Boston were closed up before the show was open or drooping hopelessly over the edges of the vases. Mr. Dorner's new variety, Bridesmaid, which many were anxious to see, arrived in a sleeping condition, and Simmons' Rose Queen was not exhibited. Altogether the seedlings were superior, and showed the usual annual advance in the quality of Carnations.

Recent Publications.

The Forest Flora of Japan. By Charles Sprague Sargent, Director of the Arnold Arboretum. Houghton, Mifflin & Co., Boston and New York.

The notes for this volume were collected by Professor Sargent in the autumn of 1892 when traveling in Hondo and Yezo, and they were first printed in the issues of this journal during the year 1893. Our readers, therefore, need no information as to the particular way in which the subject has been treated, nor need they be reminded that the book has a peculiar and practical value for American planters, since the climatic conditions of north-eastern Asia are so similar to those which prevail here, especially in our Atlantic states, that the trees and shrubs of one region can usually be trusted to make themselves at home when removed to the other. The original pictures are here reproduced, and with the beautiful type and printing on broad-margined pages the volume is a most attractive one.

Notes.

Dr. Hoskins calls attention to the fact that the greater portion, if not all, of the Russian Apples seem able to resist the scab fungus.

The peach-growers of the southern states declare that the freezing weather has not destroyed the fruit-buds, as was reported, but that it has held the buds back so that the bloom will be later than usual, and, therefore, ensure the blossoms and the newly set fruit from injury by late frosts.

Mr. Thomas Meehan takes note of the fact that the beautiful Cypripedium insigne is a good window plant. Its native habitat is in deep shade, so that the obscurity of a dwelling-

house is rather agreeable to it, and as it naturally flowers in winter it needs no forcing to make it bloom. A plant is mentioned which is growing in an eight-inch pot under ordinary living-room conditions, and during the past winter it had seven flowers, which began to open early in December and have continued one after the other until February.

The most conspicuous objects in the windows of the florists' shops just now are compact plants of Azalea in full bloom. It is rather strange that the newer varieties are mostly those which bear double flowers, since the single-flowered kinds are generally more effective. The fashion, imported from France, of swathing the plants as well as the pots with ribbons and paper and decorating them with bow-knots of various material has nothing to commend it. Much of the beauty of a well-grown plant is in its form, and when this is hidden by upholstery the plant loses half its charm.

A broad sheet, entitled *The Spray Calendar*, prepared by Mr. E. G. Lodeman, has just been issued by the horticultural division of the Cornell Experiment Station. It gives a list of the remedies for the more dangerous fungous diseases and insects, which are to be used on different fruits and crops. It tells how, when and how often to apply these remedies, and in different kinds of types it indicates the comparative importance of the applications to be used. All the needed facts are grouped together in a convenient form, so that this will not only be efficacious in instructing those who are not well informed on these matters, but will serve to remind those who already know how to make these applications when the time for using each has arrived.

An English lady, Miss Wilkinson, has, in recent years, made herself widely known as a landscape-gardener, capable of undertaking public works and of carrying them to completion under her personal supervision, and Vauxhall Park, in London, opened to the public last year, is one of her latest works. Commenting upon these facts, and characterizing Vauxhall Park as "a remarkable work in every respect," the *Revue Horticole* recently said: "So we see that a woman has entered the professional camp, the camp of practicing artists, and has proved her right to a distinguished place in it by worthy results. It seems a curious sign of the times. Who knows whether the delicate gifts of woman may not introduce valuable innovations, unknown refinements, into our gardening conceptions?"

The current number of *Scribner's Magazine* contains an article on bedding-plants, by Samuel Parsons, and it is illustrated by some excellent pictures taken from actual groups in the different parks of the city. All of these beds are easy and natural—that is, they show no trace of formality or mannerism—and there are accompanying maps which explain the method of arrangement, the plans having shaded sections to indicate the particular plants which are used in every location. The pictures show how much better this irregular planting is than straight ribbon lines or geometric beds, and the maps explain that the irregularity is no haphazard mingling together of different forms, sizes and colors, but a well-studied system, analogous to that which a good planter would use in disposing trees on a wood border, or of shrubs when massed for general effect. Tender bedding-plants are always expensive; they are often misplaced, and where they can be made effective masses of select woody plants and perennial herbaceous plants are preferable, as a rule, and the shrubs will have a beauty of their own all winter. But in large places and public parks bedding-plants will add variety to the garden effects aimed at, and the grouping described and figured in this article is much more satisfactory than the regular and rigid carpet patterns so often used. Particularly pleasing are the examples where single plants or groups of two and three have broken away from the mass and strayed over upon the turf.

Both in England and in America "lumber" means useless, bulky things which are cumbersome or in the way. In America only it is also used as a synonym for "timber sawed or split for use." This fact all modern dictionaries note, but even the American ones make no attempt to trace its origin. It is interesting, therefore, to find such an attempt in an article recently published in the *American Architect and Building News*, and signed by Mr. C. W. Ernst. In what Mr. Ernst calls "the Tudor period" of Boston's existence, between 1630 and 1720, its chief article of trade, he says, "was wood in all its forms, especially for fuel and building purposes. The article had to be brought to Boston by boats. These boats were apt to discharge at random. The harbor front and wharves were accordingly 'lumbered up' with all sorts of forest products to the inconvenience of the public, which traveled pre-

ferentially by boat and frequented the wharves relatively more than we do." Therefore, in 1663, the police "were instructed to 'clear the ends of all streets and wharves that but upon the water from all lumber and other goods.' This is the first use of the word lumber for sawed wood. The Boston Town Order of April 27, 1663, called the sawed wood the timber (hewn), the masts and other wood brought to town by boats 'lumber,' because the cargoes lumbered up the harbor-front. The new meaning was immediately adopted, and lumber, in the sense of sawed wood, is the least restricted as well as the earliest of all Americanisms."

During the year 1894 the importations of bananas into the United States amounted to nearly 18,000,000 bunches. Heavy cyclones throughout the West Indies last autumn destroyed much of this year's crop, and the few cargoes now coming from Jamaica and Cuba bring high prices, some bananas of the first grade selling last week for \$1.40 a bunch by the truck-load. Nearly one-third of all these imports usually come from Jamaica alone, so that the market has been considerably affected by the shortage. But change in the wholesale prices of bananas does not seem to affect the prices asked for them by retail dealers, who the year through offer three of the best quality for five cents, and fairly good bananas for a cent each. W. & C. Smith, on Liberty Street, now have a supply of the small Lady-finger banana, from Colon, for which buyers acquainted with their delicate flavor pay twenty-five cents a dozen. Unusually fine plantains, each twelve to fourteen inches long, sell at the same place for fifty to sixty cents a dozen. Partially ripened ones are used by Spanish residents for boiling, while the fully ripened fruit, with blackened skin and softened pulp, are considered preferable for frying. Spitzenberg, Northern Spy, Greening, Ben Davis and Baldwin apples are regularly quoted in the wholesale market reports, and form the staple supply. These sorts cost from \$4.00 to \$7.00 a barrel for good grades, some exceptionally choice and fancy apples commanding even higher prices. A selected lot of Baldwins of uniform size, deep, rich color and high quality recently brought \$10.00 a barrel at wholesale. Retail dealers in high grades of fruit offer beautifully colored Winesaps and Northern Spies. Newtown Pippins, from California, cost fifty cents a dozen, and the more acid Pippins from Ulster County, in this state, bring seventy-five cents. California Seckel pears, held over in cold storage, may still be seen in the fancy fruit stores and cost from sixty cents to \$1.00 a dozen. The last specimens of the larger D'Alencon are seventy-five cents to \$1.25 a dozen, while well-ripened Easter Beurres and P. Barrys bring seventy-five cents to \$1.50 a dozen, and Winter Nelis fifty to seventy-five cents. California strawberries, looking unimproved by their long journey, cost seventy-five cents a pint, and the first strawberries from Lakeland, in southern Florida, fresh and bright and in good order, are sold at the same price. In addition to damage to the orange crops in other parts of the world, there is now well-authenticated information that the crop in Sicily has been damaged by hail storms. Some 40,000 boxes of this Mediterranean fruit will be sold in this city this week, but even so large a quantity does not supply the loss of the Florida crop, since at this time last year 60,000 boxes of Florida oranges made an ordinary week's supply here. Some extra-sized Navel oranges, from Florida, held here since before the freeze in that state, sell for \$2.00 a dozen. They are too large to be profitable, even at this price, since they measure twelve inches in circumference, and the largest actually weigh two pounds each.

Mr. John J. Thomas, one of the most eminent pomologists of the country, died at his home in Union Springs, New York, on the 22d of February, at the ripe age of eighty-five years. From his father, who was a naturalist and explorer of distinction, he inherited the power of original research which led him to investigations and experiments which have been useful in so many branches of horticulture. Among his works, *The American Fruit Culturist*, which was first published fifty years ago, still remains probably the most useful work of its kind. It has been revised many times to keep pace with the advance of pomology in this country, and the latest labors of Mr. Thomas were given to the preparation of a new edition which is to be published in May. Nine volumes of miscellany, entitled *Rural Affairs*, which are selections from the *Country Gentleman*, of which he was an associate editor, and another interesting work on *Farm Implements and Machinery*, were prepared by him and they rank among the most useful manuals for a country library. Personally, Mr. Thomas was a man of great simplicity and sincerity of character, combining sturdy integrity with a rare refinement, gentleness and unflinching charity.

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLES: —The Forests of the Wabash Valley. (With figures)	101
Lumbermen and Forestry.	102
Notes on the Distribution of the Yellow Pine in Nebraska. (With figure.)	Professor Charles E. Bessey. 102
Troublesome Grasses in Southern New Jersey.	Mrs. Mary Treat. 103
PLANT NOTES:	104
CULTURAL DEPARTMENT: —Germination of Black Walnuts and Acorns,	George B. Sudworth. 105
A Few Annuals.—II.	J. N. Gerard. 106
Bulbs for Spring Planting	F. H. Horsford. 106
Notes on Violets	W. N. Craig. 107
New Grapes	E. P. P. 107
Early Flowers	J. N. G. 107
The Columbian Raspberry	E. P. T. 107
CORRESPONDENCE: —The Gypsy Moth in Massachusetts	Walter C. Wright. 108
The Meeting of the American Carnation Society	R. A. 108
The West Coast Spring	F. E. Johnson. 108
RECENT PUBLICATIONS	109
NOTES	110
ILLUSTRATIONS: —Present and past distribution of Yellow Pine in Nebraska, Fig. 15	103
Spanish Oak, <i>Quercus digitata</i> , Fig. 16	104
View in the forest on the bottom-lands of White River, Indiana, Fig. 17	105

The Forests of the Wabash Valley.

THE composition of the remarkable forests which, in spite of the terrible inroads that have been made in them during the last twenty-five years, still cover considerable portions of the region in southern Illinois and Indiana watered by the Wabash River and its tributaries, was first made known to the scientific world by a paper published in 1882 in the fifth volume of the *Proceedings of the United States National Museum*, by Dr. Robert Ridgway, the ornithologist of the Smithsonian Institution.

Dr. Ridgway was born in Mount Carmel, on the banks of the Wabash River, nearly opposite the mouth of White River, and his early work in his chosen field of science brought him into familiar intercourse with the trees of that region, which he has studied faithfully and lovingly whenever opportunity offered until the present time. By a piece of very great good fortune his investigations have, moreover, been supplemented by those of another naturalist, Dr. Jacob Schneck, who for many years has lived in Mount Carmel and has also been specially interested in trees. The result of this fortunate association has been that the forests in the neighborhood of the mouth of White River have been more carefully studied than those in any other spot of equal interest west of the Allegheny Mountains. Other regions with a similar climate and with as good soil can be found in western Kentucky and Tennessee, in south-eastern Missouri, eastern Arkansas, and in the delta of the Yazoo in western Mississippi, and may, perhaps, produce as remarkable individual trees in as great a variety of species, but none of them have been as carefully studied, and, until some other forest containing a greater variety of trees and larger individuals can be found, that of the lower Wabash valley must be considered the most remarkable aggregation of trees in the north temperate zone. On the western slopes of the Big Smoky Mountains, in Tennessee, there are wonderful trees in great variety, and individuals of some species, although not so tall, probably, produce in that forest their largest trunks; and in climbing about four thousand feet from the banks of the little Tennessee, in North Carolina, to the summits of these mountains one can count nearly fifty arborescent species, although individual trees are smaller than on the western flank of these mountains.

In a second paper on the Wabash Silva, recently published in the seventeenth volume of the *Proceedings of the National Museum*, Professor Ridgway shows that the number of indigenous arborescent species in the Wabash valley south of the mouth of White River is one hundred and seven, or more than a quarter of all the arborescent species in North America north of Mexico, and even this number can be slightly increased, as one or two species of *Crataegus*, overlooked by Professor Ridgway, grow near Mount Carmel.

Some idea of the surprising richness of the forest-flora in this region can be obtained by an examination of Dr. Ridgway's list of trees growing on restricted areas. On a tract of seventy-five acres he found fifty-four species of trees, and another of twenty-two acres contained forty-three species. On a tract of forty acres one mile southeast of Olney, in Richland County, Illinois, what the author modestly calls an imperfect survey of the woods shows thirty-six species. The nearest approach to such a concentration of tree species in a restricted area is in central Yezo, where Professor Sargent found sixty-two species and varieties of trees growing in the immediate neighborhood of Sapporo at practically one level above the sea.

The height attained by these Wabash valley trees is as remarkable as the number of species in the forest. Individuals of forty-two species reach a height of one hundred feet, and those of twenty-one species grow to the height of one hundred and thirty feet. Individuals one hundred and fifty feet high of thirteen of these species have been measured. A specimen of *Quercus Texana*, called *Quercus coccinea* by Dr. Ridgway, the tallest of the Wabash Oaks, and, perhaps, the tallest Oak in North America, measured one hundred and eighty feet, and a Tulip-tree one hundred and ninety feet; a Pecan, the tallest Hickory, one hundred and seventy-five feet; a Cottonwood (*Populus monilifera*), one hundred and seventy feet; a Bur Oak (*Quercus macrocarpa*) one hundred and sixty-five feet; while, in addition to the trees already mentioned, a Liquidambar and a Black Oak attained a height of one hundred and sixty feet. The size of the trunks of some of these trees, measured at three feet above the surface of the ground, is hardly less remarkable than their height. A Sycamore (*Platanus occidentalis*) girted thirty-three and a third feet; a Tulip-tree twenty-five feet; a White Oak twenty-two feet; a Black Walnut twenty-two feet; a Black Oak twenty feet, and a Texas Oak twenty feet. In comparison with such trees, the inhabitants of eastern forests, where trees one hundred feet tall are extremely rare, appear like pygmies, and persons familiar only with forests of the Atlantic seaboard can form no idea of the magnificence of these trees, the last remaining vestiges of the forests which covered the valley of the Mississippi when the white man first floated down its placid waters.

This region is the home of some of our most beautiful and valuable trees. On the bottom-lands of the rivers the Pecan and the great western Hickory (*Hicoria laciniosa*) grow with all the Swamp White Oaks, the Pin Oak, the Texas Oak, and that remarkable form of the Spanish Oak, which, usually an upland tree, sends up on these bottom-lands a tall, beautiful shaft covered with pale bark, which might readily be mistaken for the trunk of one of the White Oaks. The illustration on page 104, made from a photograph, for which we are indebted to Dr. Schneck, represents one of these trunks. The attention of scientific men is first called to this variety in Professor Ridgway's second paper, although it has long been known to southern lumbermen. Common in the Yazoo delta and in eastern Arkansas, and not rare in northern Alabama and western Florida, it is valued as a timber-tree, and is said to produce wood equal to that of the White Oak. In the Wabash valley the southern Cypress (*Taxodium*), the Water Hickory, the Water Locust and the Planer-tree, all denizens of the south, find their northern homes, and there the rare Swamp Cottonwood grows to its largest size, and the Catalpa displays its greatest beauty. In these lowland forests great

lianes festoon the trees, and Dr. Ridgway tells us of Grape-vines with stems more than a hundred feet long and more than a foot in diameter, and of Aristolochias, Poison Ivies and Bignoniæ nearly as large. No other American forest-scene is more beautiful, and certainly no other forest of deciduous trees, for it must be remembered that in all this great collection of trees there is not a single species with evergreen leaves, is more interesting. A view in one of these bottom-land forests, with masses of the Virginia Creeper clothing the trunks of the trees, appears in the illustration on page 105 of this issue, made from a photograph, for which we are also indebted to Dr. Schneck. No picture, however, can give an idea of the stateliness and grandeur of these noble trees, or of the luxury of the annual and perennial plants that cover the forest-floor with almost impenetrable thickets.

In ending this brief notice of Dr. Ridgway's most interesting and important contribution to dendrological science, we cannot refrain from the hope that equally well-trained and enthusiastic observers may appear to study the composition of other forest-regions in the Mississippi basin before the demands of a larger population destroy the noblest deciduous-leaved trees that the eyes of man have rested on.

THE most encouraging sign that the time is approaching when our wasteful methods of lumbering will give place to something like an intelligent system of forestry, is the attitude of the lumbermen and the lumber-trade journals. Only a few years ago anything like a criticism of the prevalent methods of clearing away the woods was resented and sneered at as sentimental, and any prediction that the timber supply could be exhausted within a given number of years was attributed to ignorance. In these days, however, we expect to see in the lumber-trade journals sound advice about forest-preservation, and the lumbermen, whose business it has been to cut and market timber, are now thoroughly alive to the fact that they must look forward and provide for the future as well as for the present. All this was clearly shown at a late meeting in Boston of the vigorous Northeastern Lumbermen's Association. After the inevitable banquet of such occasions the keynote of the most effective speeches was "the slaughter of the forests must be diminished." Mr. George B. James, who presided, affirmed that the output of New England forests depends upon their intelligent management; that under proper forestry conditions the supply of lumber may be continued for many years to come; without proper management their market value is soon destroyed and generations must elapse before timber can be reproduced upon land that is stripped of every vestige of growth. When lumbermen clearly apprehend that the future of their business depends on the care with which our forest-resources are husbanded, we can begin to hope that the end of useless forest-destruction is at hand.

Notes on the Distribution of the Yellow Pine in Nebraska.

THE central portion of Nebraska is occupied by a peculiar region covering fifteen to twenty thousand square miles, known as the Sand Hills, now practically treeless, except in the deep cañons, and made up of an undulating surface of grass-covered sand, not infrequently consisting of deep valleys bordered by very steep hills from two to four hundred feet high.

A somewhat prolonged study of these Sand Hills has led me to the inquiry whether they have always been treeless. They bear no little resemblance to many regions still covered with Pines in other portions of the United States. I have traveled for days through Pine-forests in Michigan, which if denuded of trees would be much like our Sand Hills, both as to soil and surface configuration. It is not impossible that forests formerly covered the Nebraska

Sand Hills, as in places they still do the sand hills of Michigan.

As we pass up the cañons of the larger streams we find trees. These are mainly of eastern species, and it is possible that they migrated hither, and never spread from the narrow cañons. This appears to have been the opinion of Hayden and many other of the early explorers of the Plains, and I think it is still the prevailing belief that these hills were always destitute of forests. Let us, however, consider the following facts:

(1) There are many isolated cañons which contain trees.

This suggests that either (a) the seeds of these trees must have been distributed by birds or winds, or (b) a former more general distribution. It is not probable that birds and winds carried the seeds to these cañons. The physical barriers are often too great to warrant us in assuming that birds were the agents in distributing the seeds from which sprang the forests in isolated cañons. Nor can we assume that winds carried the seeds. We are forced to assume that the forest-areas must have formerly been more extended, sufficiently so to connect these isolated cañon forests with one another.

(2) There are in these cañons western as well as eastern trees and shrubs.

This fact is significant, as it requires some further explanation of the origin of the present cañon flora. These western trees and shrubs could not have reached their present stations unless conditions favorable to forest-vegetation were formerly much more general than now.

(3) The Yellow Pine, *Pinus ponderosa*, var. *scopulorum*, of the Rocky Mountains, now grows with other trees upon the hills of Pine Ridge from the Wyoming line, in Sioux County, to the Dakota line, in Sheridan County.

In this region there are eastern and western trees, and they are growing upon the hilltops as well as in the valleys and cañons. I have seen hundreds of trees of Yellow Pine growing here upon the open hillsides and upon the most exposed buttes.

(4) The Yellow Pine is now to be found in the cañons of the Niobrara River and its tributaries as far east as the border of Holt County.

In the cañons the Pines are growing thrifly, and in many places young trees are springing up abundantly. Several years ago I saw such a new growth of Pines in the northern part of Brown County, where the cañons are still full of fine healthy Pine-trees. There is nothing in these cañon Pines to suggest that conditions are now less favorable than they formerly were, but when one studies the borders of the cañons carefully, evidence is not wanting to the contrary. Here trees are found upon the most exposed points and crags, where it would now be practically impossible for them to obtain a foothold. Many of them are evidently the veterans holding desperately the stations otherwise practically abandoned by the species in its losing fight against unfavorable conditions.

(5) The Yellow Pine extended eastward along the North Platte River and the Lodge Pole Creek to Deuel County, until the pioneers destroyed them forty or fifty years ago.

In some places this destruction has been so complete that scarcely a trace now exists of the Pines. Nothing could better illustrate the rapidity with which all traces of these trees may disappear than their history along these two western streams.

(6) The Yellow Pine grew in considerable quantities in at least one station on the Republican River until destroyed by the early settlers.

Until within a few months it was generally supposed that the Yellow Pine never had grown naturally in the Republican valley. Last fall Mr. E. M. Hussong, of Franklin, in Franklin County, found several decaying stumps of Pine on the south side of the river, near the town, and upon close inquiry learned from the oldest settlers that in the early days small Pine-trees had been dug up in the cañons and on the bluffs and transplanted to dooryards and gardens, while the large trees were taken for fuel and fencing

purposes. That the Yellow Pine was a native tree at this point is proved beyond question, and we are led to suspect that an equally careful search will show its former existence in other places in the valley.

(7) In the Loup Valley there are Yellow Pines on the South Loup, Middle Loup and North Loup Rivers.

These occur in widely isolated cañons, which have no forest connection with one another. Since all the branches of the Loup head in the Sand Hills, the occurrence of Pine on their borders is very suggestive.

(8) Logs and fragments of Yellow Pine-trees occur here and there in the Sand Hills.

A few years ago an old hunter at Norfolk told me that he had frequently found old pine logs in tramping over the Sand Hills, and that these had often served to make his camp-fire. Professor Bruner a few years ago saw a settler's wagon in the south-western part of Holt County on which were fragments of pine wood cut from a pine log found on the top of one of the hills. Professor Samuel Aughey also, who traveled over the state a great deal in the early days before the hunters had used up all these fragments for fuel, states that he has repeatedly found such logs or fragments.

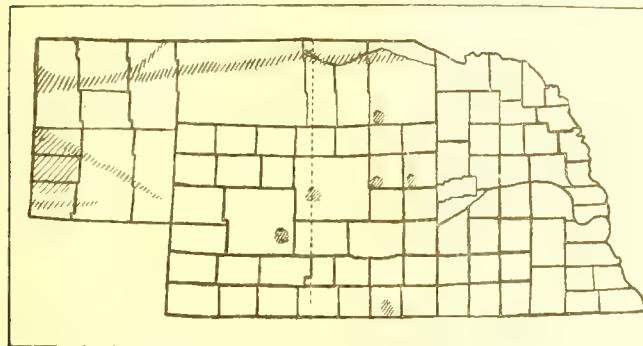


Fig. 15.—Present and past distribution of Yellow Pine in Nebraska.—See p. 102.

Now, add to the foregoing facts another which but recently came to light, and which shows that in places from which all external traces of the Pine have disappeared they may have existed in comparatively recent times. A few weeks ago Mr. I. A. Fort, of North Platte, placed in my hands a fragment of a pine stump dug out of the ground in Conroy Cañon, in Lincoln County (on section 17, township 11, range 27), about fifteen miles south and eighteen miles east of the city of North Platte. This is about one hundred miles east of its range on the Platte River as hitherto known, and in a locality in which the former presence of Pine was unexpected. Putting all these facts together (see map), I feel warranted in concluding that the area of Yellow Pine in this state must have been formerly much greater than it is to-day. I think I can safely say also that it is reasonably probable that the Sand Hills were once wooded with the Yellow Pine.

Lincoln, Neb.

Charles E. Bessey.

Troublesome Grasses in Southern New Jersey.

THE Grasses are, by far, the most important order in the vegetable kingdom, yet we find even in this well-regulated family many species that are worthless, and others that are worse than worthless—actually vicious. Like most noxious weeds, our troublesome grasses are mainly foreigners. The Crab-grass, *Eleusine Indica*, as its name indicates, comes from the east, and is a nuisance in newly formed lawns and in dooryards generally. It has ascending wiry stems and is not at all handsome. Another species, *E. Ägyptiaca*, has a more creeping habit; it runs along, rooting at the joints as it goes. It often gets into Currant rows and among other small fruits. I have seen a single plant some yards in length. Sometimes it climbs up into the bushes among which it grows. In uprooting it, if a single joint is left a new plant is speedily formed.

Fortunately, both this and *E. Indica* are annuals and more easily subdued than if they had perennial roots.

The Couch-grass, *Agropyrum repens*, is naturalized from Europe, and is one of our worst perennials. It increases rapidly by long running root-stocks. We have several forms of this species which seem to be indigenous. It is one of the most troublesome weeds in southern New Jersey, especially near the coast. Our Wheat, *Agropyrum vulgare*, belongs to this genus, the good and bad being often closely related in the vegetable as well as in the animal kingdom. Cheat, or Chess *Bromus secalinus*, is very troublesome here, especially in half-neglected orchards and vineyards. Last year I noticed whole acres completely covered. This, too, comes from Europe, and it is pretty well known everywhere. Two or three species of Foxtail Grass are troublesome in cultivated grounds, all of which are from Europe.

The Bermuda, or Scutch Grass, *Cynodon dactylon*, is not pretty on our lawns, as it is a coarse, creeping, much-branched grass, and difficult to eradicate where it gets a firm foothold. It is a perennial and also comes from Europe, and is sometimes cultivated for pasture. I am sorry to say that one of the most pernicious of all our grasses, the Bur-grass, *Cenchrus tribuloides*, is a native of southern New Jersey. In neglected places, and in vineyards and orchards which are plowed only once or twice a year, this pest is almost unbearable. Several years ago I became possessor of a place some five acres in extent, mostly in fruit—vines and trees—which had been neglected for years. The entire place was almost literally covered with Bur-grass, and it has been a continual war of extermination ever since. Some three acres of Grape-vines were uprooted and put into civilized grass, which has effectually routed it from that quarter, and an acre or more was put into lawn-grass, which has about eradicated it here. But the sharp-barbed burs which cover the seeds are everywhere, and the plants steal in among Currant and Gooseberry rows and wherever they can find a bare spot that is not often stirred. This terrible pest extends all along the coast and about the great lakes and rivers to the southwest as far as southern California.

Two other species of this Bur-grass occur in southern and lower California. *Cenchrus Palmeri* has more wicked-looking spines than ours; when young it is greedily eaten by cattle, but they give it a wide berth as soon as the involucres harden, and the injury caused by its burs more than outweighs its value as a forage-plant. *C. myosuroides* is another species growing in the south-west. This is less objectionable than the others, and produces a good crop of forage when young, and the prickly seed-envelopes are not quite so bad as the others.

The Nut-grass, *Cyperus rotundus*, is a great plague here in cultivated grounds. It is not a true grass, however, but belongs in the vast family of Sedges. The members of this great order are usually harmless, and mostly useless, except to beautify the earth, often growing, as they do, luxuriantly where other things refuse to thrive. This Nut-grass is said to come from the more southern states, but I am sure that it must be indigenous here. At all events, ever since the settlement of Vineland, it has been a pest in cultivated grounds. It is distributed both by seed and by small potato-like tubers, which are produced on long, slender root-stocks running out from the plant in every direction, which in sandy soil reach a yard or more in length, and the plow and cultivator help to distribute the pest by breaking the runners and scattering the tubers, when each will make a new plant if not constantly kept in check.

I subjoin an extract from an article sent out by the Government on the best means of eradicating Coco, as this pest is sometimes called :

The plan of campaign to extirpate Nut-grass is simply to prevent it maturing seed above ground. Nearly everybody thinks that the nuisance reproduces itself from the nutalone, whereas it propagates a thousand times more from the seed. Hence, to effectually and quickly destroy Nut-grass on any land infested with it, the soil should be frequently stirred during the grow-

ing period of summer so as to stimulate each nut tuber and seed to sprout. It is a waste of effort to attack Coco in winter, either by digging or plowing, or turning hogs on it. The best time for fighting it is between midsummer and frost time. Although myriads of the sprigs will show themselves above ground in a day or two after each working of the soil, even in the spring months, yet no seed-stem will shoot up till late in the season, and the secret of success, as before remarked, is



Fig. 16.—Spanish Oak, *Quercus ilex*.—See page 101.

merely to cut down every tall stem, while in the flowering stage at the latest, and the sooner the better. The old method for destroying Coco, by cutting it off under the surface of the ground every time a sprig appears above the surface, is a useless expenditure of labor. The ground should be often stirred with the plow or hoe, from April to frost, as before mentioned, to make every nut and seed come up if possible, and as soon as possible, but there is no urgent necessity, as far as eradicating the grass is concerned, to kill its sprigs until they begin to shoot up seed-stalks. For this purpose it is only requisite to plow or chop down the grass at the regular intervals of working Indian Corn, Collards, or any other crop. Still it is advisable to plant the land in some tall-growing crop which shall neither cover nor obscure the Coco seed-stems, and thus keep them from being observed and destroyed. By the above method two years are ample time in which to rid any ground of Coco. In fact, one season is sufficient to eradicate it, except that a few scattering sprigs will show themselves in subsequent years, which can easily be prevented from going to seed by close attention. One cause that has enabled Coco so long and so defiantly to hold its sway in the south is that we have so few crops which are hoed or plowed in the fall of the year. This, together with the popular error that Coco propagates from the nut alone, explains the whole story of its universal triumph over the patience, sweat, curses and blows of the millions who have warred on it.

Vineland, N. J.

Mary Treat.

Plant Notes.

KERRIA JAPONICA.—A recent number of *The Garden* speaks of the cheerful green tint of the long slender branches of Kerria Japonica in the winter-time. We can add that what is true of this plant in the soft climate of

England is equally true here, where the yellowish green stems of the Kerria, better known here as the old-fashioned Corchorus of our gardens, rival the Willows and Cornels in their pleasing effects, especially when they stand out in contrast to the drab or dead brown of many other shrubs. The double-flowered form of this Kerria, which is closely allied to the Pearl Bush, or Exochorda, has long been a favorite in country gardens because of its easy propagation, its ability to endure considerable shade and to the fact that it bears a few scattered flowers occasionally all summer long. A much more beautiful shrub is the rarer single-flowered form, the flowers of which are nearly an inch and a half across, and produced singly on slender stalks, where their five bright yellow petals and numerous long stamens are seen to first-rate advantage against the light green foliage. This was one of the first plants ever introduced from Japan, and it is still among the very best. As we have said, it is beautiful in winter, beautiful in early June with its bright flowers, and in early November it is one of the most distinct ornaments of the shrubbery, when its foliage turns to a clear sunny yellow, which is unsurpassed. In good ground the Kerria attains a height of six feet or more, and it becomes as broad as it is high. It is perfectly hardy in this latitude, although farther north the ends of the branches are sometimes killed in winter. The single-flowered kind is quite superior to the other, but, for some reason, it is seldom seen in shrubberies, and, indeed, until recently it could hardly be found in American nurseries.

SYMPLOCOS CRATEGOIDES.—A correspondent inquires the name of the Japanese shrub with blue berries. There are species of Viburnum, Vitis and other genera with fruits more or less blue or purple, but perhaps the plant sought for is *Symplocos cratægoïdes*, or, as it was formerly called, *Symplocos paniculatus*, a hardy shrub sent to this country from Japan nearly a quarter of a century ago and distributed by Messrs. Parsons, of Flushing. Though it has been known so long it is still by no means a common inhabitant of our gardens, although its clean foliage, graceful flowers and almost unique fruitage ought to command a place for it in every considerable collection. It was figured in GARDEN AND FOREST, vol. v., page 89, where the white flowers, each less than half an inch across when expanded, and borne in short loose panicles, and the racemes of fruit each one being the size of a pea, and borne on the last year's growth, are well shown in Mr. Faxon's drawing. But what gives the plant its singular value is the deep ultramarine blue color of its fruit, which is borne in great abundance. It is a broad tree-like shrub with dark green leaves, softly pubescent on the under side, and which have so far in this country been free from the attacks of insects and fungi.

DIPLARRHENA MORÆA.—This is an interesting Tasmanian Iridaceous plant with curious habit, which bears very pretty flowers. The plant has narrow leaves, which grow in clusters, and increases by new shoots from its short creeping rhizomes. It also throws out thin wiry stems from the bases of the clusters, and on these flowers are borne singly, but in frequent succession. These stems, which are not larger than an oat-straw, keep growing in length, and finally produce new plants. Mr. Endicott, in an early number of GARDEN AND FOREST, spoke of a stem that had grown to a length of ten feet in his greenhouse. The flowers are charming in appearance, but very fugacious, lasting at most only a few hours. They are Moræa-like in form—nearly flat. The large segments are white, with orange spots; the small segments are white and narrow. The stigmas form a purplish central crown. The flower is about two inches in diameter, and is followed by seeds borne in long-pointed three-sided capsules, the planes of which are concave. As will be seen, this plant is readily increased. It offers no difficulties in cultivation, and there are few greenhouse plants which will survive more neglect, as it seems insensible to drought.

JATROPHA PODAGRICA.—This is an interesting euphorbiaceous plant from New Guiana. Cassava and tapioca are made from the roots of some species of Jatropha, but this

one is noteworthy for its curious stem and the peculiar arrangement of its flowers. The plant grows readily from seed, and has a gouty stem, about a foot and a half high. The goutiness appears at the top, the stem being crudely described as like an inverted ten-pin. The smooth leaves are five-lobed, four or five inches across, and usually disappear late in the year. The flowers are borne from the top of the stem on short peduncles, and are small bright coral red, and in racemes irregularly arranged, so that the effect is of a bunch of coral. Well-established plants flower frequently, whether the plant is leafless or otherwise.

Cultural Department.

Germination of Black Walnuts and Acorns.

M R. JACK'S articles in *GARDEN AND FOREST* (vii., 135; viii., 6) on "Patience with Germinating Seeds," and "Germinating Nuts and Acorns," recall an interesting observation lately made on the retention of vitality in black walnuts. So far as I know, the behavior of this seed appears to be quite phenomenal.

under the direction of the Division of Forestry, the nuts having been kept during the preceding winter spread out in a thin layer on the ground, with a light cover of débris. The soil was a slightly loamy sand, and when planted the nuts were covered to a depth of from two to four inches. Within ninety days after the planting, a large percentage of the nuts germinated and the plants made a vigorous season's growth. One year from the planting (March, 1894), in taking up the seedlings, eighteen to twenty nuts were found, in different rows of the plantation, in various stages of germination, the radicles being from one-quarter to three inches in length, all in a perfectly vigorous state. When found, the nuts were covered to a depth of from two to three inches.

Professor W. J. Beal has recorded * some observations which are interesting in this connection. In addition to a number of weed seeds, deeply buried in sand for ten years and then uncovered in order to test their vitality, he mentions the burying also of black walnuts and Black Oak acorns at depths varying from a "few inches" to three feet. Some of the nuts and acorns within a few inches from the surface of the ground germinated the first season; all the acorns at a depth of eight inches to two feet were decayed; a few acorns at a depth of two to three feet were found to have germinated, and the aborted plantlets were still alive at the end of nearly four years.



Fig. 17.—View in the forest on the bottom-lands of White River, Indiana.—See page 101.

As a rule, the mature fresh nuts of the Hickories and Walnuts planted in the fall, or, after proper care during the winter, planted in the spring, germinate during the first season, not "lying over" and germinating the second, as is sometimes observed with other less bulky forest-tree seeds (*Robinia*, *Gleditsia*, *Gymnocladus*, *Acacia*, *Fraxinus*, etc.).

In March, 1893, ten bushels of black walnuts were planted

But all of the black walnuts buried from eight inches to three feet deep were decayed, there being no indication of germination as in case of the acorns.

The greater ability of acorns to preserve their vitality for a limited time in a quiescent or germinated state when deeply

* *Proc. Soc. Prom. Ag. Sci.*, 1889, p. 15.

buried was further well demonstrated in the planting of five bushels of Cork Oak acorns (*Quercus Suber*) by this Department in 1892. Through carelessness in planting—the acorns being plowed under contrary to instructions—many of them were buried to a depth of six to eight inches; and while a larger number were decayed at the end of twelve months, one in about every dozen was found to be either in a fresh state or with germination more or less advanced. The ascending axis was in no case, however, much developed, the main energy being exhausted in the production of large radicles.

Professor Beal does not state how many walnuts he buried, but presumably the quantity was small and, perhaps, not sufficient to indicate the retentiveness of vitality in the species which appears to be fairly well shown in the case of the Department plantation. The explanation of the long retention of vitality in the case of these black walnuts must, doubtless, be found in an accidental but proper adjustment of moisture conditions—dependent upon the season and character of soil—conditions which, in all cases, have much to do with the behavior of all planted seeds.

Department of Agriculture, Washington, D. C. *Geo. B. Sudworth.*

A Few Annuals.—II.

SWEET ALYSSUM is one of the best-known annuals for a front border, and it has a dainty beauty but is not as fragrant as its common name would seem to indicate. A dwarf form, Tom Thumb, has lately been introduced, and makes good compact-growing plants. The variegated Sweet Alyssum can only be increased by cuttings. Seeds of Sweet Alyssum planted in the open are quite certain to germinate, and the plant will often perpetuate itself by self-sown seed. There are several hardy Alyssums, mostly yellow, and these are excellent for borders; the best is probably *A. saxatile*, which in the early spring is cheerful and attractive. This sort may be bought of the hardy plantsman, as seeds do not germinate readily.

Candytuft (*Iberis*) is a hardy annual, which may be sown in the fall in a warm garden. This flower, in its shades of white and mauve, is pretty in the borders, but only one crop of these is produced, and this is soon over. As these flowers are in umbels, they are not especially useful in floral arrangement. The hardy Candytufts are easily established, and are among the best of trailing, half-shrubby perennials, bearing flowers of the purest white for many weeks.

The Balsam, *Impatiens*, is one of those plants concerning which every seedsman takes especial pride in declaring that his strain is sure to produce double-flowered kinds. With all their beautiful pure colors and their old-time associations they appear to me unpleasant plants owing to their fleshy stems. One of the prettiest bedding effects I have seen was made with *Impatiens Sultani* with a border of silver-leaved *Centaurea*. This *Impatiens* requires warmth and careful treatment of the seed, though it is easily increased by cuttings.

The single annual Chrysanthemums are pleasing plants in the garden, although the flowers and foliage are rather soft for cutting. The flowers are mostly yellow or creamy white, with dark eyes. The plants are thrifty, and one and a half to two feet high, and continuously in flower.

The annual and biennial Larkspurs require less space than the hardy perennial kinds, but the latter are so much more effective that the annuals and biennials are not much valued in gardens now. I seem to have omitted Forget-me-not, *Myosotis*, from both of my former lists, but I should not forget to give it a place in my garden. The Forget-me-not is not only a flower of sentiment, but of dainty beauty. It is of the easiest possible culture. None of the varieties are prettier than *M. palustris*, which has escaped from cultivation, as the botanists say, and is now found at home in moist places everywhere. It is, however, a rather sprawling species, and for the garden *M. dissitiflora* is one of the best. *M. alpestris Victoria* is also a fine kind, very compact and floriferous, but with short stems. Although Forget-me-not requires much moisture, this should be at the roots, and not near the leaves, which rot if exposed to wet. Their small shining black seed germinate readily, but the seed-bed should be shaded.

One cannot have a complete old-fashioned garden without Four-o'clocks, *Mirabilis*, with their sweet-smelling flowers so strangely opening to greet twilight wanderers in the garden.

Nicotiana affinis is a hardy annual which will perpetuate itself in the garden from self-sown seeds. It is a tall noble-appearing plant, with leaves decreasing in size from the base upward. The large white flowers, with long tubes, open in the early evening, and are pleasantly fragrant. They remain open until the middle of the morning, and are capital for even-

ing decorations. This is one of the last annuals to be cut off by frost.

Few packets of seeds will make a greater show in the garden than one of Petunias, and once established they will be happy there, for they are hardy annuals, great seed-bearers and every seed seems fertile. Perhaps the best all-round Petunia is the large-flowered white, which is apparently a distinct species. This is not only a good garden plant, but will do well in the house, where its fragrant flowers are very satisfactory. There are many bad faded colors among the Petunias, and they need careful culling. The Countess of Ellsmore was a great gain for a pure rose-color, but lately a new strain from California, of very large, curiously marked, fringed flowers, promises to supersede the old kinds. A strain of large-flowered, double Petunias has also become fixed, but to many persons these flowers, from their confused and lumpy character, are hardly worth growing.

Calendulas, Pot Marigolds, have already been mentioned, but there is another pretty kind of these known as *C. fluvialis*, which bears a single white flower with brown reverse. This is well worth growing, though of weedy habit, and, like all single Calendulas, closing at night or during cloudy days.

Phlox Drummondii is a pretty as well as popular annual in a great variety of colors. It is most effective in the garden when planted in separate colors, beds from seed mixed haphazard having no consistency or meaning, and are moderately useful for cutting. The general effect of these plants, unless they are well grown, is ragged.

Portulacca will thrive in dry borders in full sunshine, where few other plants will survive, and are certainly showy, though there is always a suggestion of Pusley attached to them. They are tender annuals, and the seed will not germinate without considerable heat.

Salpiglossis has curiously shaped and oddly marked flowers, not very showy or pure in color. One season's trial of this plant will satisfy most gardeners.

Spherogete speciosa is an old annual, not as generally grown as its merits deserve. It is a yellow composite, with narrow ray florets, and the plant is of neat habit. Objection may be made that yellow-flowered composites are very plentiful and one would preferably grow those which are of the readiest culture; still *Spherogete* offers no difficulty, the seeds germinating readily.

Ten Weeks Stocks are great favorites in some gardens and with some florists, the double sweet-scented white flowers being lasting and useful for floral work. But there is a suggestion of lumpiness about the flowering plants, both in the garden and when used for bouquet work. Seeds of fine double Stocks are apt to have delicate germinating powers and they require careful attention to make them germinate.

Swan River Daisies are small plants with delicate, finely cut foliage and small blue flowers, which I always enjoy seeing in the garden. They are pretty in a front border and are sometimes useful in a delicate floral arrangement. In spite of their almost minute habit they are easily grown and the seeds germinate readily in the border.

Elizabeth, N. J.

J. N. Gerard.

Bulbs for Spring Planting.

AMONG bulbous-flowering plants for spring planting, the Tiger Flowers are an important group. Those most commonly offered by American dealers are varieties of the Peacock Tiger Flower, *Tigridia pavonia*, a native of Mexico. Among the varieties are *Grandiflora*, *Grandiflora alba*, *Conchiflora*, *Speciosa*, *Grandiflora rosea* and others. The three most distinct varieties are *Grandiflora*, in which the leading color is crimson; *Grandiflora alba*, principally white; and *Conchiflora*, orange-yellow. There are other intermediate forms in which these colors vary, all of them very beautiful. Indeed, it would be difficult to imagine a variety of the Peacock Tiger Flower that is not beautiful. The flowers of these, as of all *Tigridias*, are short-lived, but they continue to come, day after day, and under favorable conditions until autumn frosts kill the buds. One great point in favor of this class of bulbs is that they are cheap. They increase fast by division, and even as far north as Vermont, when the frosts hold off late in the autumn, they mature sufficiently to be wintered and flowered the following year. They need to be kept in a warm dry place; in a cellar they generally decay before spring. The soil best suited to these bulbs is a warm sandy loam, with good drainage. They need plenty of moisture until after flowering, and in a dry season this must be artificially supplied. The bulbs should be planted deeper than most bulbs of their size.

Other species of *Tigridia* are cultivated, but they are not so striking or showy as these. *T. Van Houttei* has lilac and pur-

ple flowers, a little more than an inch wide, borne in great profusion, not rarely thirty flowers from a single bulb. This species is one of the easiest to grow, but the flowers are not very striking and make a poor showing by the side of a variety of *T. pavonia*. The flowers of *T. Dugesii* are still smaller, and scarcely an inch wide; they are nearly white, tinged with violet or purple.

One of the most desirable of the smaller bulbous plants of this class is what is sometimes called *Tigridia Herberti*, but which, though of the same natural order, is not a *Tigridia*, but a *Cypella*, a native of Buenos Ayres. It closely resembles the Tiger Flower and thrives nicely under the same treatment. The flowers are an inch wide or more, yellow, varying from light to a darker shade, and the plant is increased by division.

Until last season I found *Bessera elegans* a difficult bulb to grow. The trouble was in the drainage. It needs a light loamy or sandy soil and the driest possible place. I doubt if it is possible to give this plant too dry a place. Of course, it needs to be reached by rain, but the moisture should drain off as fast as possible. In such a place I had perfect success, and the bulbs were monsters as compared to the collected ones. It blooms earlier than the Mexican Star Flower, *Milla biflora*, and is, on this account, more sure to ripen in our shortseasons.

Milla biflora has bulbs similar to those of the *Besseras*, but the plant is quite unlike it in many ways, and although the scarlet drooping flowers of *Bessera* are pretty, the much larger pure waxy-white ones of the *Milla* are, to my mind, much handsomer. They are more durable, and on long, naked stems well suited for cutting. The *Milla* is not so difficult to grow, and any good garden-soil will suit it.

Charlotte, Vt.

F. H. Horsford.

Notes on Violets.

WITH the lengthening days and increasing sunlight, Violets grown in cold frames are now blooming profusely; the flowers are much superior in quality to those produced after this time in greenhouses, as these are now coming small, pale and showing signs of exhaustion. As the time for severe frost is probably past, the leaves which have been packed round the sides of the frames can be removed and utilized in making hot-beds; it will not be safe, however, to dispense with mats and shutters, in this latitude, at least, before April 1st. More frequent waterings will now be found necessary. Violets are more often injured by too little than by too much water. A little liquid-manure can advantageously be used; an application once a week during the remainder of the flowering season will be helpful. As the midday sun is now strong, some shade should be given to the plants for a few hours every day. Lath shadings are good for this purpose, but if these are not at hand a light coating of lime-wash should be applied to the glass. This shading keeps the plants cooler, and Violets dislike a high temperature. We find that the flowers come of a deeper color and last much better when grown in shaded frames than when exposed to the direct rays of the sun. Air must be freely admitted, for no plant resents coddling more than the Violet. Runners are now being produced quite freely; the best of these can be taken off and dibbled quite thickly into boxes of sandy compost, care being taken to secure stock from the healthiest and most vigorous plants.

Lady Hume Campbell is not a satisfactory winter bloomer in cold frames with us, and it appears to require more heat than Marie Louise, which blooms freely all winter long, and up till March 1st had given ten times as many flowers to plants as the Lady Campbell; the last-named sort is now flowering abundantly. As grown by Mr. H. Nuebner, of Groton, Massachusetts, this variety is superb, and with most growers it has been a success. It cannot be called disease-proof, however, as we have during the present winter seen two or three establishments where it had been quite wiped out by the leaf-curl.

Where Marie Louise can be grown well it is still ahead of all its competitors. The new Farquhar promises to make a strong bid for popular favor. Some three weeks ago I visited the greenhouses of the Messrs. Farquhar, in Roslindale, Massachusetts, to see the new variety at home, and looking over the whole stock saw no trace of disease. Every plant seemed in perfect health; the flowers were of good size and borne on long stems. The color is similar to that of Marie Louise, although the distributors of the plant claim that it comes even darker. It more nearly resembles Marie Louise than Lady Campbell, although it seems quite distinct from both in habit when a batch of the two is seen together. Mr. Farquhar pointed out a number of plants of their new kind planted among the diseased stock, which were perfectly clean, and yet we have no idea that it will be proof against disease.

Among single Violets it is still hard to beat the Czar. One or two other kinds produce a few more flowers, but they are of greatly inferior quality. Wellsiana is a fine kind, but produces runners sparingly, hence is increased slowly. The new California will be quite extensively planted next fall; so far as we can judge from flowers on young plants received, it is very similar to the Czar, but if it produces flower-stems of the size and quality claimed and proves a satisfactory winter bloomer, it may eventually supplant that good old variety.

Taunton, Mass.

W. N. Craig.

New Grapes.

THOSE who are looking for new grapes of high quality may safely select the Alice, which keeps well in common storage until March. It resembles Diana more closely than any other grape I know, but the color is more like that of Catawba. The flavor is sweet, and the skin lacks wholly the unpleasant tang left by Catawba. In the size of cluster and in general appearance Alice is much like Delaware, but the berry is fully as large as that of Catawba. The skin is tough, and dries like that of Diana, without rotting, and the grape is sugary, qualities which suggest that it would make good raisins. The seeds are small, and there are not many of them. It ripens about September 20th to September 30th. Growers of this Grape report that the wood is hardy and matures well, and that its foliage is heavy and the canes strong.

Mr. George C. Campbell, of Delaware, Ohio, the veteran Grape-grower of the United States, has a seedling which ripens early, the grapes being large and black. This new sort has not yet been sent out, but one more really good Grape may safely be counted upon.

Of the Concord seedlings and other recently introduced early or late white sorts, Colerain seems to me the best. It is one of the earliest, ripening about the last of August. It has few seeds, and these are small, and medium-sized bunches of good-sized berries. The color is greenish white, with a fine bloom. The vine is a strong grower, and it is altogether hardy.

Points which all new Grapes should include are short-jointed wood, berries of good size, adherence to the stem after ripening, small and few seeds, uniformity in ripening. Of course, quality and quantity will be demanded. An otherwise excellent Grape, the Diamond, is lacking in uniformity of ripening, and it is altogether uncertain whether it will mature by September 10th or not until a month later. Many of Rogers' seedlings are, like Lindley, too long-jointed.

Clinton, N. Y.

E. P. P.

Early Flowers.—The winter season just closing was remarkable in this locality for continued low temperature. From Christmas until the end of February there was seldom even a superficial softening of the ground on sunny days, and there were no nights without a freezing temperature. Under these conditions winter flowers made no progress, and Snowdrops, which were showing color in the middle of December, made no advances until the slightly rising temperature of the first days of March allowed them to expand. Now Snowdrops are daily becoming more plentiful, and the first of the Scillas are showing color, while the earliest Crocuses are in bud.

The Snowdrops in flower at present are *Galanthus imperati*, Atkins' fine variety, and forms of *G. Elwesii*. The newer forms, *G. Aidin*, *G. Cassaba*, *G. globosus* and *G. unguicularis*, are as forward to flower as the type. The scorching cold has burned foliage not affected in ordinary winters. The leaves of Oriental Poppies have been cut off, and Primulas are mats of brown leaves. Some of the early Irises have lost their foliage, while others are fresh and untouched. The vagaries of frost are past finding out.

Elizabeth, N. J.

J. N. G.

The Columbian Raspberry.—From my experience with the Columbian Raspberry I have found that the stalk is sometimes as large as a stout staff and the general growth is very luxuriant. The fruit is more dry than that of the Schaffer, and will both ship and can better. It is more nearly a purple than a red raspberry, but the color is brighter than that of Schaffer in the dried berries. The yield is enormous. It is unquestionably a cross of Blackcap and Red Raspberry parents. My seedlings of Schaffer almost all came black, and they are subject to the same disease that affects our black Raspberry—an anthracnose—the same disease which put an end to growing the purple Rochelle and which threatens to kill out the Schaffer. It is a mistaken prejudice with the majority of buyers to prefer red raspberries for all uses, but for home use I think the Columbian a decided acquisition.

Clinton, N. Y.

E. P. P.

Correspondence.

The Gypsy Moth in Massachusetts.

To the Editor of GARDEN AND FOREST:

Sir,—This statement relates to about thirty-three acres of land in three separate parcels, all located in Medford, Massachusetts, and in the section described by the Gypsy Moth Commission as infested. It is about three-fourths woodland, with the remnant well sprinkled with Apple and shade trees.

Finding that all his force would be likely to be fully occupied elsewhere, the field superintendent kindly gave me permission, last spring, to take charge of this land myself for the purpose of suppressing and preventing the multiplication of the moths upon it, and, if possible, exterminating them. For this purpose a good supply of burlap and creosote-oil was given me.

The work has been done at odd times by myself, my daughter and a hired man; and we are satisfied with the result as evidence that the gypsy moth, like most other noxious insects, may be reduced to harmless proportions, at small expense, by all private land-owners who choose to attend to the matter for themselves. Indeed, the expense and trouble is so small, and the result so satisfactory, as to prove that it would seem a simple waste for the state to be at further expense, and cause much private annoyance, by continuing the work of the commission with the aim of absolute extermination, instead of confining its efforts to the suppression of the insect from year to year on public grounds, in coöperation with their custodians, and on neglected private premises, besides the reasonable inspection of private grounds cared for by the owners, with their knowledge and in their presence, or that of their authorized agents.

We destroyed from 10,000 to 12,000 caterpillars in their season, and have since found and painted with creosote-oil about 115 patches of eggs. Fully half of these were under stones on the ground, and nearly all could be reached without climbing. Some ground now covered with snow is yet to be searched. While it is very improbable that no bunch of eggs has been missed where search has been made, it is very certain that those missed are too few to be a material harm. Not a tree or bush on our premises was noticeably stripped of foliage by the moth during the season. No trees were burned, marked or marred by them, and all burlap used was taken down and burned at the close of the season. We have enjoyed the privilege of helping ourselves, and hope we may be allowed to enjoy it in future.

The commission, as a branch of the work of the State Board of Agriculture, has a permanent use and value, especially if clothed with enlarged powers to cover all sorts of rapidly multiplying, and therefore noxious, insects. But we believe that function should be exercised in harmony with private-wishes, but never in private grounds except at private cost.

Medford, Mass.

Walter C. Wright.

The Meeting of the American Carnation Society.

To the Editor of GARDEN AND FOREST:

Sir,—Allow me to add some notes to your account of the meeting of the Carnation Society in Boston. The first thing to strike the visitor was the large proportion of recent varieties in the exhibition and the absence of the old kinds. The object of the raisers and growers seemed to be primarily a stiff stem and, by means of disbudding, large flowers, but the lack of a good stem outweighs every other good quality, and, therefore, many of the old sorts, no matter how beautiful they may be, unless they yield abundantly and are borne on strong stems, have little chance in the race. And, really, this is a proper line of selection. Objection has been made to the practice of disbudding, and there are æsthetical people who would rather see smaller flowers and the buds remaining as they are in nature, but, after all, a Carnation cannot be made ungraceful even by extreme disbudding, as a Chrysanthemum can be when similarly treated. Among the whites old varieties are practically gone. Mrs. Fisher and Lizzie McGowan are comparatively recent, but they are grown only in the east and in separated districts. Silver Spray is the favorite white of the west. Anna Webb still holds a leading position among the crimsons. Jacqueminot and the Stuart (red) were not shown well, even by their introducers, but they both have the great advantage of a good stem. Among the scarlets I still like Portia, because of its healthy abundant bloom and its perfection of form. It has the demerit, however, of being small. A scarlet Carnation with a flower as large as that of Hector, but

with all the other good qualities possessed by Portia, would be an acquisition. As far as simple flowers were concerned Hector was pronounced the best scarlet exhibited, but it has the great defect of a feeble stem. The striped Helen Keller, unique in its class and magnificent in its form, is not only a Carnation of the best type, but it stood the test of two days' exhibition better than almost any variety in the exhibition. It was whispered that these flowers were cut before they were quite matured, and this may account, to some extent, for its holding so well. If this is true, why should not exhibitors act upon it? Some may have failed because in their anxiety to secure the fullest development of their flowers they allowed them to remain on the plant too long. The eastern exhibits went down badly on the second day. It was held by some that this was caused by overfeeding. These are points certainly worth studying and settling.

The old yellows are out of date, and such varieties as Buttercup and Bouton d'Or are the principal ones grown. Success with each of these depends much on local and special conditions, and there are a few growers who have mastered these conditions so well that they have the field almost to themselves. Many good Carnation growers find these varieties hard to propagate. President Dailedouze starts his plants early and gets a long season's growth, and from my experience this seems a good way to treat all yellow-flowered Carnations. The Buttercups exhibited by Mr. Southworth, and the Bouton d'Or by Mr. Dailedouze, were certainly remarkable.

The seedling table, devoted to varieties not yet distributed, was always surrounded by growers who came to select novelties. Every one must agree with what was said by the President about the advantage of having plants as well as cut blooms exhibited, for, otherwise, it is impossible to get at the character of the varieties. Storm King was the best white, in my opinion, although it is not very fragrant, but Alaska had many admirers, and those who have seen it growing declare it has all the qualifications of a good commercial variety. The flower is good in form, with a good calyx and stem, and pure in color and very fragrant. Della Fox looked promising the first day, but it folded badly on the second. It is of the most delicately shaded salmon-pink in the way of Daybreak. Triumph was a most promising new pink, resembling its parent, William Scott, and it stood the test of two days' exhibition even better than that good plant, and it had a better stem. Sylphide, a delicately tinted pink, also stood up well. Lena Saling was the best rose-pink on the first day, but it wilted on the second. Isabella Hunnewell, red-striped on a yellow ground, attracted much attention on account of its distinctness. The purest yellow shown was Henrietta Sargent. The flower is slightly undersized, and so far the plant has not been very productive. Eldorado, a picotee-edged pink, on a yellow ground, was, to my thinking, the handsomest in this class. It was finely fringed, which is an important qualification, and it stood the heat well, although it has not the best of stems. If a stem can be too good, Jubilee has this drawback. The stems of some of the flowers were so strong as to be rigid and ungraceful. It is an exceedingly bright scarlet, although the flower has not the best of forms. Perhaps the most distinct seedling of all was Maud Dean, which is quite a new departure, the petals being suffused with a color which may be called violet, deepening to the base. The form is perfect, and it lasts well.

By the way, the second prize for the best hundred white flowers was won by a seedling of Mr. Nicholson, and not of Mr. Chitty, as stated in your last week's report.

R. A.

The West Coast Spring.

To the Editor of GARDEN AND FOREST:

Sir,—While the days are growing longer and February is relaxing its icy hold on the Atlantic states, the West Coast is in the full tide of its growth and beauty. Broad fields of grain stretch away in billows of green—not the dark blue green of New England grain-fields, but a bright sunny green born of a kinder climate. The uplands are wrapped in varying shades, from the almost golden-green of the pastures and wheat-fields through the deeper tones of the Laurels and Bays, the still darker ones of the Live Oaks, up to the dusk of the thickets on the mountain sides. The deciduous trees are putting forth their tender leaves, wild flowers are everywhere and in every color, and give tint to the whole landscape. In the orchards the Almond-trees are all shimmering with a mauve-colored veil of blossoms, the Peach-trees are beginning to open, and brown buds of Plum, Prune, Cherry and Pear trees are swollen to bursting, while among the trees the ranchmen are turning up

red furrows and cattle stand knee-deep in clover. Through open windows we look across the broad Santa Clara valley, where occasional gleams of white show the clustered buildings of the ranches, with the steeples of the town of San José, ten miles to the north-east. At the further rim of the valley is the line of the foothills with their varying opalescent colors as the shadows of the clouds chase over them, and above these are the ragged peaks of the Coast Range, with Monte Diablo, dim and cloud-like, fifty miles to the northward. While we read of the wild weather of the east, stormy seas and snow-covered earth, we have balmy air and singing birds and blossoming flowers in the most delightful season of the year on this coast.

I. E. Johnson.

Los Gatos, Calif.

The Preservation of the Colors of Dried Flowers.

To the Editor of GARDEN AND FOREST:

Sir,—In your issue for March 6th I notice your London correspondent's remarks on the drying of flowers by means of heat, in order to preserve their colors. I can thoroughly endorse the utility of this method, as I have used heat for all dryings which I have made, and with most satisfactory results. I struck upon the idea quite accidentally some seven or eight years ago.

New York.

Leonard Barron.

Flowering Branches of Viburnum lantanoides.

To the Editor of GARDEN AND FOREST:

Sir,—On one of the coldest days in February I received a package by express, and after the removal of several layers of thick paper, masses of large showy flowers were found carefully wrapped in cotton, and suggesting that it was summertime somewhere. At first I thought of the Flowering Dogwood, but when they were fully uncovered I recognized them as the large cymes of the Moosewood or Hobble-bush, *Viburnum lantanoides*. The summer and autumn aspects of this tree are very familiar to many persons, but as its flowering-time is in late May, the flowers are not so generally known. This plant was figured in GARDEN AND FOREST, in vol. ii., page 535, and is there described as the handsomest of the native American Viburnums, and one of the most beautiful shrubs of our flora. The flowers I had received came from Cherryfield, Maine. The bare twigs had been cut and placed in water and set in the house for a fortnight, when they expanded into the flowers which I had received. No attention was given them except to remove them from the direct rays of the sun in the middle of the day. I have often seen branches of our spring-flowering ornamental shrubs and fruit-trees coaxed into bloom after this fashion, but certainly nothing of the kind equals in effectiveness this native wilding, with the hydrangea-like corollas of the neutral flowers on the margin of the cyme an inch or more across.

Andover, Mass.

A. S. D.

Recent Publications.

/ *The Wild Garden*. By W. Robinson. Illustrated by Alfred Parsons. Fourth edition. London: John Murray.

In the preface to the new edition of this book, which has become a classic among those who are interested in naturalizing hardy plants from other countries, the author tells us that it is more than twenty years since the first edition saw the light. He adds that during all these years his experience has gone to confirm his faith that where the original purpose of the book is carried out with due regard to soil and other surroundings of the plants, the open-air gardens of England may be made more artistic and delightful. The Wild Garden, as it is understood in this book, is not a careless and neglected tangle, nor is it the result of sowing the seeds of annual flowering plants in a haphazard mixture. Its controlling idea is the introduction of the plants of other countries which are as hardy as the hardiest of native common flowers in places where they will flourish without further care or cost. It has, therefore, nothing to do with what is often called a "wilderness," nor can it be confused with a picturesque garden, nor does it interfere in any way with the regulation flower garden. Judging from his own effort and experience, Mr. Robinson has achieved his highest success in the establishment of early-flowering bulbs in the turf of fields mown for hay, where, without interfering with the value of the crop, blue

Anemones, Snowdrops, Dogtooth Violets, Fritillarias, Wild Honeysuckles and Tulips bloom in the most natural way and have the most effective setting. The mountains of central Europe, Greece and Asia Minor furnish plants which blossom earlier than those of England, and, therefore, in warm soils which are sheltered by groves and banks of evergreens, the meadows which stretch about nearly every English country house can be made bright with early bloom. But the book deals as well with native flowers, and one of its most delightful chapters is that on British wild flowers and trees. But there is no need of enumerating or characterizing the contents of a book which is, perhaps, as well known as any other work on ornamental horticulture in the language. The very names of the chapters are suggestive of the wildness and freedom and natural charm of the scenes which Mr. Robinson describes and of the compositions he suggests. The art of Mr. Parsons is always delightful, and all his illustrations are engraved on wood, and have an effectiveness and finish which can hardly be excelled in works of their class. Mr. Robinson promises that in future editions some ideas of the book, which are as yet only in the type, may be seen more clearly in new illustrations, so that the reader may gain a clearer knowledge of what the author means when he speaks, for example, of the possible beauty of hedgerows and grass walks.

Of course, many of the cultural directions do not apply to plants in our climate, and many of the plants which thrive in English gardens would never become naturalized here. Nevertheless, the pictures and the text are both instructive and stimulating, and will suggest experiments which cannot fail to bring pleasure and profit to any one who undertakes them.

Notes.

Sunday last was the first really spring-like day of the year in this vicinity, and under its genial sunshine some of the Crocuses expanded for the first time. *Crocus Imperati*, the most robust of those we saw in a small collection, had fully opened its rosy purple segments and yellow anthers, while *C. biflorus*, equally early, but not as showy, was quite attractive with its lilac and white segments and orange-colored anthers.

The Sweet Pepperbush, *Clethra alnifolia*, is an excellent native shrub with a peculiar value, from the fact that it shows its long spikes of pure white flowers and yellow anthers late in summer, when it has few rivals in the field. In the last number of *Meehan's Monthly*, one of these shrubs on the editor's home grounds is described as fifteen feet in diameter and twelve feet high at the age of twenty years. With the delightful fragrance of its flowers, in addition to their beauty and attractiveness to honey-gathering insects, it is a charming ornament in its season.

Catawba grapes from New York state may still be had in fair condition, a five-pound basket costing twenty-five to thirty cents. Almeria grapes continue moderately plentiful, and sell at thirty to fifty cents a pound, the pink-tinted fruit bringing the higher price. Hot-house grapes are always scarce in February and March, and the only fruit of this class now to be had here are small lots of Gros Colman from Belgium. These bring the fancy price of \$3.25 a pound, but their dry stems and the tendency of the grapes to drop indicate the approaching end of their season. Black Hamburgs from Rhode Island are usually the first hot-house grapes seen here in the spring, and these will not be on the market before the first week in April.

The scale insects have not been very troublesome heretofore in the northern and eastern parts of the United States, but one of them has appeared in New York orchards, attacking Plums and other trees, and threatens to become a serious enemy. It may have inhabited certain orchards in small numbers for some time, but it never caused any alarm until within two years, and now it threatens the total destruction of thousands of trees. Mr. Slingerland, of Cornell University, has been making a study of this insect, and, although its life-history is not yet thoroughly understood, he has discovered enough to enable him to state that it can be destroyed by persistent spraying before spring growth begins. In an illustrated bulletin just issued by the Cornell Experiment Station, Mr. Slingerland explains how it can be distinguished from the San

José scale, and gives directions for treating the trees with the kerosene emulsion, so as to prevent it from getting started in April. The bulletin will be of great use to those whose trees are infested with this new pest if they will heed its instructions.

At the late meeting of the Carnation Society, in Boston, President Dailedouze stated that the cutting-bench fungus was more likely to appear when the benches were made of old boards. All the woodwork should be treated with a coat of warm lime before it is used. It was also suggested that sand more than two or two and a half inches deep was likely to harbor this fungus, since it did not dry out quickly. Mr. Chitty warned propagators against using the sand a second time, and other members stated that when it was necessary to use the sand over again it should be drenched with water which contained a minute proportion of carbolic acid. A solution of copper sulphate of the strength which is used in spraying would be equally good.

The last number of *The Gardeners' Chronicle* contains a good picture of the variety of *Doronicum plantagineum* known as *Excelsum* or *Harpur Crewe*, and recommends that after flowering in spring these plants can be taken up and planted in a reserve garden, so as to give room for other plants. We have often commended these hardy perennials for their beauty, and they have the advantage of being taller than most plants which flower in this season, and their large golden yellow ray-florets make very conspicuous objects. Plants of many of the *Doronicums* taken up in autumn and potted can be had in fine flower during late winter and spring, and if started in a cold frame even now they will make good decoration for the conservatory later on.

Professor Wiley, Chemist of the United States Department of Agriculture, has been making some investigations as to the possibilities of Sweet Cassava as an agricultural crop in the southern states, and he pronounces that it can be grown with safety and profit in the peninsula of Florida, and probably in the coast region of the other Gulf states. It contains so little ash and nitrogen that it will produce in poor sandy soils four or five tons to the acre, and the fresh roots will yield twenty-five per cent of starch of a high grade, which can be used as a substitute for the starch of Maize. A superior tapioca can be prepared from the plant, and so can glucose, and it furnishes an excellent food for man and for cattle, although it is deficient in albumen. To make a well-balanced ration for cattle it should be mixed with one-fourth of its weight with cotton-seed oil cake.

Professor Budd, of the Iowa Agricultural College, writes that he fears the losses to the Orange groves of Florida are even more serious than has been stated. Of course, the present crop is all gone, but the fact that many of the Orange-trees remained leafless after deciduous trees had come into leaf seemed to indicate that they have received a severe shock. If cut back, Professor Budd thinks, they may start from the stubs, but their vitality may be too low to give paying crops of fruit. He adds that the trees which were cut back by the frost of 1886 have never paid for the space they occupied, and that many of them which did come into leaf the next April died during the following summer. Of course, time alone will reveal the full effects of this disaster and enable us to calculate the total loss. We hope, however, that Profesor Budd's view of the case will prove too gloomy.

When Layard first uncovered the ruins of Assyria he identified, among their sculptured ornaments, representations of grape-bunches, pomegranates, reeds and apples, and, with regard to the prominent objectso frequently held in the hands of the chief figures portrayed on the bas-reliefs, he wrote that he "would not hesitate to identify it with the pineapple unless there were every reason to believe that the Assyrians were unacquainted with this fruit," and he added, "the leaves sprouting from the top prove that it was not the cone of a Pine-tree or Fir." As it is now well known that the pineapple is of American origin, Layard's doubt upon this point is confirmed; and Dr. E. Bonamia, in his recently published *Flora of the Assyrian Monuments and its Outcomes*, asserts his belief that the symbol represents a Cedar-cone, which was used in religious and royal ceremonials to sprinkle holy water. Illustrating his words with reproductions of the ancient sculptures, Dr. Bonamia also claims that he has identified among them figures of the Date-tree, the pomegranate, the fig, the banana, the Pine-tree, the melon, the Reed, the Lily, the Baobab and some daisy-like plant. But, perhaps, the most interesting of his suggestions is the one he makes with regard to the origin of that ornament, so familiar in heraldry and decorative

art, which we call the fleur-de-lis. It has never been well established that this ornament was evolved, as its name implies, from an Iris-blossom ; and Dr. Bonamia thinks that he has traced it back, not to any other flower, but to the Assyrian custom of tying a pair of horns to a Date-tree as a charm against evil spirits. Representations of these "luck-horns" are frequent on Assyrian monuments, and Dr. Bonamia argues that the way in which they are attached explains the origin of that fillet or cross-band, so conspicuous in the ornament called the fleur-de-lis, which, of course, has no prototype in the Iris or any similar flower.

Botanical science has sustained a fresh loss in the death of Mr. John H. Redfield, which occurred at his home in Philadelphia, February 27th. Mr. Redfield was born at "Middletown Upper Houses," now Cromwell, Connecticut, July 10th, 1815, and had nearly completed his eightieth year. He came from a pure New England ancestry, John and Priscilla Alden being among his progenitors. His father, William C. Redfield, at the birth of his son a country storekeeper, was a man of much more than ordinary intelligence, who became in after years a noted meteorologist, and made important discoveries in regard to the rotary and progressive movements of storms. The elder Mr. Redfield looked well to the school facilities of his district, and here the son's education was commenced. It was continued at Stamford, Connecticut, at the High School in New York city, and finally at a private school. While at the school in New York, to which city his father brought his family in 1824, a teacher strengthened his inherited love of scientific pursuits, by taking him with him in his country walks and instructing him in mineralogy. In this way also he acquired the love of botany, which distinguished him later. In the interval between his attendance at the different schools he heard Dr. Torrey's lectures on chemistry. In 1836 he became a member of the New York Lyceum of Natural History, and this intensified his boyish interest in the sciences already named, besides developing in him a taste for conchology. At this time, Dr. Asa Gray was librarian and superintendent of the Lyceum, and here began the friendship which became closer with passing years, and continued through life. In 1843 he was most happily married, and in 1861 he removed to Philadelphia to take a position in the large car-wheel works of A. Whitney & Sons, his father-in-law being the head of the firm. During these years his spare time was given to scientific pursuits, especially to botany, in which the order Filices was his favorite. He had been elected a member of the Academy of Natural Sciences in 1846, and now became a life-member. In 1876 he was made a member of the Council and Conservator of the Botanical Section, and in 1879 Corresponding Secretary of the Conchological Section. A member of the Publication Committee in 1877, he became chairman in 1891. All these offices he held until his death. Retiring from active business in 1885, all his leisure time, when in the city, was devoted to the Academy, and more particularly to the botanical section, where, in the face of many obstacles, he accomplished a great work in the rearranging of the vast herbarium and in the proper mounting of a great part of it. During this period his summers were mostly spent on Mount Desert Island, the flora of which he studied in connection with Mr. Rand, the result being the excellent catalogue recently published by them. Mr. Redfield's published articles number fifty-four. Of these, forty related to botanical subjects or to botanists, twelve to conchology, one to meteorology and one to fossil fishes.

As a scientific man Mr. Redfield was held in high esteem by the leading botanists of the country. His friendship was sought and cherished by such men as Doctors Torrey, Gray and Engelmann and their successors. He was of great assistance to them by the excellent judgment he displayed in the notes he made upon the plants contained in the very important herbarium under his control, and in forwarding portions of them for inspection. The Academy of Natural Sciences will keenly feel the loss of his faithful and efficient services and of his many gifts of important sets of specimens ; and not the less, his wise counsel in its ruling board. In botany, his name is commemorated by a beautiful grass of the western plains, the *Redfieldia flexuosa*. Mr. Redfield was of most genial and kindly address. No one gave a warmer or more sincere greeting to a friend, or showed better, on all occasions, the spirit of a true Christian gentleman. Honorable to the last degree, generous and kind in every relation of life, he was yet modest in character and diffident of himself. He was almost the last remaining of the old set of botanists, among whom he was honored as an associate and loved as a friend.

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLE: —Sculpture in Garden Art.....	III
Honey Locust in the West.....	Professor Charles A. Kipfer.....
The European House Sparrow in America.....	H. C. Oberholser.....
FOREIGN CORRESPONDENCE: —London Letter.....	W. Watson.....
PLANT NOTES: —The Cherokee Rose. (With figure.).....	114
CULTURAL DEPARTMENT: —Lilies.....	E. O. Orpet.....
Cannas.....	T. D. Hatfield.....
Cut Flowers for Summer.....	W. H. Taftlin.....
Phajus grandifolius.....	Robert Cameron.....
A Few Annuals.—III.....	J. N. Gerard.....
Celosias.....	W. Evans.....
CORRESPONDENCE: —The Hardiness of the Rose Crimson Rambler.....	S. A. 117
Some New Hybrid Roses.....	J. N. Gerard.....
Market Flowers in Private Gardens.....	R. A. Weyman.....
Iasmium nudiflorum.....	Joseph Merian.....
Forest Fires in Minnesota.....	H. B. A. 119
RECENT PUBLICATIONS	119
NOTES	120
ILLUSTRATION: —A Flowering Branch of the Cherokee Rose, Fig. 18.....	115

Sculpture in Garden Art.

DURING the month of May an artistic spectacle of a novel sort will be set before the people of New York. The National Sculpture Society will then hold its second annual exhibition in the spacious galleries of the Fine Arts Building on Fifty-seventh Street. It will not be confined to works recently produced, or to American works exclusively, but will include a retrospective collection, and, therefore, even as regards the sculptor's art alone, will be novel and ought to be exceptionally attractive. But the most interesting announcement is that the purpose of the exhibition will be "to show the possibilities of combining sculpture with flowers and plants in both natural and formal gardening and in interior decoration." To this end the services of Mr. N. F. Barrett, landscape-engineer, and of Mr. Thomas Hastings, architect (of the well-known firm of Carrère & Hastings), have been secured to prepare the designs for the arrangement of the galleries and to superintend their execution, while Messrs. Pitcher & Manda will supply the plants which their schemes will require.

It is believed, the circular of the Sculpture Society adds, that the tendency of such an exhibition will be "to encourage a larger use of sculpture in the embellishment of the villas and houses of America, and to give a new and powerful impulse to the production of ideal sculpture throughout the nation." Both these aims are, indeed, worthy ones. Even cultivated Americans often regard the sculptor's art as valuable merely for the making of portraits or of monumental memorials in which portraiture plays a prominent part. They appreciate its peculiar commemorative utility, but either wholly ignore its role as a minister to the love of beauty, or consider this distinctly subordinate to what may be called its biographical function. Or, at the best, they admire classical works, consecrated by the verdict of time, and covet reproductions of them for private or public enjoyment. The cases are rare when the art, as practiced by living masters, is sympathetically approached from its purely aesthetic side. This is proved in our streets and parks, as well as in the interior of our houses and public buildings, although, as has been more than once said in these pages, even those classes of our popula-

tion which have the least education are quick to appreciate the fact if a commemorative statue is unusually successful from the aesthetic point of view.

In the time of our grandfathers a wider feeling for the beauty of statuary seems to have existed in this country. But the taste of that time was as childishly crude as its confidence in itself was childishly frank. Indoors the result was a profusion of foolish sentimental figures and models of Trojan's Column and the Leaning Tower of Pisa—often brought home as trophies from an Italian tour—of tomb-like, clumsily carved white marble mantelpieces, and of huge alabaster urns which looked like receptacles for the ashes of past generations—all being placed where it was supposed they would show to the most striking advantage, without much thought whether or no they would harmonize with their surroundings, whether or no they would increase or decrease the general beauty of the interior. And outdoors the result was urns and figures of the same sort placed in the same independent fashion, and accompanied, perhaps, by iron dogs or deer, wildfowl or wild beasts, supposed either to give dignity to the approach they flanked, or, more cunningly set amid the plantations, to afford the chance observer the high delight of a momentary belief in their vitality. As knowledge and taste have grown among us, puerilities like these have disappeared, or they survive only in isolated localities, or as piously preserved, with smiling tolerance, out of respect to some bygone kinsman. But, as yet, things of a better sort, disposed in better ways, have seldom come to take their place, and it is a place which should by no means be left empty. The sculptor as well as the painter should play his part in decorating and furnishing the interiors of our public and private buildings, and the sculptor as well as the landscape-artist and the gardener should help to adorn their surroundings. But in the one case, as in the other, two things should be considered: the intrinsic beauty of the sculptured work, and, in its character and its placing, its appropriateness to its environment. One of the most important lessons taught by the Chicago Fair was the noble decorative significance of the sculptor's art, and it was taught so emphatically because nowhere had the sculptor been allowed to feel that he could work in independence of his brother artists. Already we see the effect of this lesson in the increased amount and excellence of our architectural sculpture. And the coming exhibition, if artistically successful, may do much to assist us to a knowledge of the value of idealistic sculpture for outdoor use and of the proper ways of using it.

Fully to display the sculptor's decorative power, formal gardening schemes need great avenues of trees and great stretches of water, giving room for the introduction of stately or graceful figures in symmetrical array, for noble lengths of balustrading and fountains of monumental size. Nothing of this sort could, of course, be attempted within four walls, even were the vast interior of the Madison Square Garden to be the chosen area, and even did all the horticulturists in America contribute of their products. And with regard to naturalistic schemes the case is similar. In such schemes the sculptor can never play a dominant part, as he may in certain portions of formal schemes, and even his part as a docile assistant is rather narrowly limited, and should be played with the greatest care and discretion. Nothing is more certain to injure a naturalistic gardening scheme of broad character than the presence of the smallest piece of sculpture inappropriately placed; and, as the Parc Monceau, in Paris, proves, even Frenchmen have conspicuously sinned in this respect, admirably though they use works of sculpture in more formal pleasure-grounds like the Luxembourg and the Tuilleries Gardens. We note with regret, by the way, that the Sculpture Society's circular speaks of its exhibition as including "an exhibition of landscape-gardening." In art, as in everything else, it is important that words be used with precision, lest confusion of thought arise from verbal inaccuracy; and it would be a very confused thought,

indeed, that could picture the interior of an apartment transformed into any scene having a "landscape" character. Landscape-gardening is one branch of the art; naturalistic gardening on a small scale is another, with quite different ideals to meet as well as means to employ. No more than the latter branch, on its smallest scale, can be attempted in the coming exhibition, but, even so, right management will be still more difficult than with small formal schemes.

All this is said not to discourage in any degree the projectors of the exhibition, but to show them, rather, that the difficulties which they will meet will be appreciated by all observers who have thought about work such as they have in hand. It is a good sign that an architect, as well as a gardener, has been engaged to carry out the interesting conception of the Sculpture Society, for, in all formal gardening arrangements, architectural ideas must prevail, and to them both the gardener and the sculptor must accommodate himself. We wish these artists every success in their novel task, and bespeak wide public attention for their exhibition when its doors shall open, feeling assured that they will show us many things worth seeing in themselves, and, perhaps, some which will be of utility, as giving hints and suggestions, if not actual models, for the introduction on a much larger scale of more beauty and more variety into our public parks and the surroundings of our homes.

Honey Locust in the West.

THE Honey Locust has a much greater western range than the Black Locust, and it possesses many qualities that should make it a general favorite. It has been extensively planted, but has been used to a limited extent only. Indeed, so far as I know, its only use, except for fuel, has been as post-timber. The wood is hard and takes on a beautiful polish, while in color and grain it is much more attractive than several fashionable cabinet woods.

Repeated efforts to grow the Honey Locust at the Agricultural College of South Dakota failed. The young seedlings grew well the first year, but were killed, root and top, the first winter. In north-western Iowa, twenty-five miles north-east of Sioux City, there is a fine specimen of thornless Honey Locust, and in the grounds of the Iowa Agricultural College is the handsomest thornless Honey Locust tree I have ever seen. Its trunk is about two feet in diameter; the crown is round and well developed, with a spread of branches of about fifty feet across, and altogether it is a tree of great beauty.

Professor Silas Mason, of the Kansas Agricultural College, planted a quantity of seed of the thornless variety of the Honey Locust four years ago, and has a half-acre plat of trees from four to nine feet high. Not more than half the trees are free of thorns, and there is every gradation from smooth to very thorny specimens. These thornless Honey Locusts cannot be too highly recommended for lawn planting. They give a light, though sufficient shade, and their finely divided foliage and long brown fruit-pods make them very attractive.

On the dry uplands of western Kansas the Honey Locust is one of the most flourishing trees, as is proven by the fine growth of a plat of the species at Ogallah, where it surpasses the Black Locust in size. At Hutchinson, in the moist soil of the Arkansas valley, it also makes fine growth, thus proving its wide adaptability. Thrifty trees were seen in the suburbs of Denver, grown under irrigation. Honey Locust grows well throughout central and southern Nebraska. In an eight-year-old plat at Lincoln specimens twenty feet high were seen.

A number of years ago the Honey Locust was extensively tried as a hedge-plant, but it does not lend itself well to this use. It is too rampant a grower, and no amount of lopping, weaving, bending and pruning can keep it within reasonable bounds.

Washington.

Charles A. Keffer.

The European House Sparrow in America.

A VERY complete history of the naturalization of the so-called English sparrow, *Passer domesticus*, on this continent, together with some of the results of this introduction, was recently given by Mr. H. C. Oberholser, in a paper read before the Brooklyn Institute of Arts and Sciences. A condensation of the more important portions of this paper is herewith given:

The introduction into the fauna of any country of any foreign species is always fraught with the danger that the absence of natural checks will permit it to multiply with undue rapidity and develop destructive characteristics unknown in its home. There are certain species of birds, for example, which it is difficult to naturalize in another country, even when the conditions seem most favorable, as is proved by the frequent attempts to introduce the European goldfinch and the skylark into the United States. But when a species is found sufficiently robust to make itself at home under a new environment its very vigor will insure the development of many injurious propensities. If the persons who introduced the English house sparrow into this country had made inquiries among the farmers of Great Britain and Europe in regard to the reputation of this bird, they would have probably learned that it was hardly a safe species to colonize, having already shown what might happen by its destructiveness in Australia and New Zealand. The sparrow, however, never developed its full power for evil until it came to America, where its destructive effects have only been paralleled by the introduction of the rabbit into Australia and of the mongoose into Jamaica.

In the fall of 1850 eight pairs of sparrows were brought to Brooklyn by the directors of the Brooklyn Institute, carefully housed during the winter, and liberated during the spring. The shade-trees of Brooklyn and New York were then being defoliated by the caterpillar of the white Eugenia moth, and it was supposed that the sparrow would suppress this insect. These birds did not multiply fast enough, and in 1852 fifty more were liberated in New York harbor and a colony was placed in Greenwood Cemetery. From 1854 to 1858 sparrows were brought into Portland, Maine, and Peace Dale, Rhode Island, and in 1860 more were brought to New York and to Quebec. In 1867 eighty birds were liberated in New Haven, and in 1868 twenty were imported to Boston. One thousand were brought to Philadelphia the same year; forty were carried to Cleveland, and soon after they were transported from the eastern cities to San Francisco, Salt Lake City, Halifax and other places. Perhaps this widespread introduction was based partly on sentiment, because certain naturalized Europeans found in the chirp of the sparrow something which reminded them of their native land. But erroneous reports of the benefit derived from the presence of these birds in the cities where they were first imported made such a demand for them that it was cheaper to bring sparrows directly from Europe than to pay the price asked for them in New York city.

In the early years of their introduction the sparrows multiplied with even more than their natural rapidity because they were provided with food, shelter and nesting-places, and watched over with tender solicitude. They are subject to few contagious diseases, and their natural enemies are few. The northern shrike and the screech-owl are their only serious foes among birds, although there are others which attack them occasionally, but since the sparrows associate closely with man, this in a measure relieves them from danger; and, besides this, they have developed a wariness which enables them easily to elude even the cunning cat and other domestic animals. Where it is understood that they are as palatable eating as the reedbird, many of them are annually destroyed, but this is only in isolated localities, and it makes small impression on the great mass. The natural hardiness of the bird, its ability to endure Canadian winters and the heat of the tropics makes it at home everywhere when once established; its natural aggressiveness and marvelous fecundity aids its surprising spread. Where the ground is covered with snow for a long time, and makes it difficult for the sparrow to obtain nourishment, large numbers of them die, but it is from hunger, and not from the severity of the climate. The blizzard of March, 1888, destroyed thousands of them in this neighborhood, and for some time they appeared in diminished numbers. A severe storm in Covington, Kentucky, once choked the sewer's with dead birds, but flocks from the neighboring territory soon rushed in to fill up the gap. We may consider 1870 as the year when the sparrow had become established on this continent, and in five years it had spread over an area of five hundred

square miles in the United States and Canada, and in seven years more it had spread over more than a million square miles, and, no doubt, at the present time it can be found in every state and territory in the Union, while it has increased the extent of its habitat in the states where a few years ago it only existed in isolated colonies.

The structure of the sparrow's bill shows that it is essentially granivorous, and yet at times it destroys many insects. Just how much good is done by the bird in this way can only be found by examining large numbers of their stomachs. Investigation of this sort proves that the sparrow is a miserable failure as an insect destroyer. It never makes a practice of catching insects except to feed its young, and these insects are usually of those species which are most easily secured, and are found where the sparrow most commonly resorts. Only in exceptional cases has it ever made any inroads into the ranks of insect pests. It is even open to question whether it destroyed any of the Eugenia moths in New York, for which it was originally imported. Young sparrows eat many more insects than adult birds, and yet insects are not necessary for their healthful existence, and they can be reared exclusively on a vegetable diet. Out of 522 dissections, including young and old, made by the United States Department of Agriculture, the presence of insects was shown in only ninety-two, or seventeen and six-tenths per cent., of the stomachs examined, while the actual proportion of insect food to other food did not exceed two per cent. Besides this, the greater portion of the insect food taken by these sparrows consisted of species which are either neutral or directly beneficial. A single yellow-billed cuckoo was found to have destroyed 250 fall web-worms besides other insects, and all of them injurious, a bulk equal to the entire amount of insect food in all the 522 sparrows examined. In the city of Albany during 1885 the caterpillars of the white-marked tussock moth were so abundant that they were seen crawling everywhere, even over the boxes that sheltered the sparrows, and yet the birds were never known to disturb the insects. On the contrary, by driving away other birds which naturally destroyed them, the sparrows fostered the increase of the pest. These and other species of injurious insects have thus increased with alarming rapidity in localities where the cause was evidently the protection accorded by the presence of the sparrow.

The sparrow feeds to some extent upon the seeds of weeds, but this benefit is very slight, since the weeds grow where the destruction of their seeds is of little importance. Grain and the seeds of grasses are regularly sought by them, and they do much more injury than is generally imagined. Wheat is their favorite grain, and the damage done to this alone amounts to one-quarter of the whole crop. They usually attack this as soon as the kernels mature, but even when left in shock or stack it is still subject to depredation, for the sparrows devour all the grain in the exposed sheaves. To vary their bill of fare they also attack grapes, cherries, apples, pears and small fruits and vegetables, and the damage done to these crops is always serious. Ornamental vines, evergreen trees and hedges are subject to serious injury when the birds select them for a nesting-place. A sparrow has been known to strip the buds and blossoms from the entire branches of fruit and ornamental trees, nibbling off many times more than it could possibly eat, apparently for amusement, and the dissection of birds shot while thus engaged failed to disclose the presence of any food, excepting the buds and portions of the blossoms. It may be readily seen, therefore, that the damage to fruit trees must be considerable, and much of the injury usually attributed to other causes can probably be traced to this source.

The sparrow is naturally pugnacious and he persecutes many native birds, assailing the chipping sparrow in flocks, and even larger birds when they are rendered by accident defenseless, pursuing them furiously until they are dead. They have been known to attack young robins in their nests, and even domestic pigeons and common fowls are molested for the purpose of robbing them of their food. The scarcity of many of our native birds about our dwellings is to a great extent owing to their quarrelsome dispositions. They seem absolutely fearless and will attack a blue jay or a crow, and by the force of numbers compel even these to retreat. But such birds as associate naturally with man are the greatest sufferers. Among these the blue birds, the purple martin, the robin, the house wren and several swallows are most frequently and seriously disturbed, because their nesting-places are naturally coveted by the sparrow, and many other birds are driven from the vicinity of human dwellings where they naturally congregate.

The sparrow has manifestly few good qualities, and all arguments urged in its defense have been abandoned one by one.

The evidence against its character is conclusive: it is a parasite, and its extermination would be a desirable thing. The difficulties in the way of this, however, seem insurmountable. Bounties offered are practically useless, since so insignificant a number are killed that their loss has no apparent effect on the steady increase. An estimate based on the lowest bounty which would produce any desired result shows that to exterminate the species in Ohio alone would cost the state two and a quarter millions of dollars, and even this would not avail unless the adjoining states pursued a similar course. Since the total extirpation of the pest seems impracticable, this article has been prepared simply to show the true character of the bird and to set forth the necessity of some action looking toward the restriction of its unlimited multiplication on this continent.

Foreign Correspondence.

London Letter.

PHAJUS BERNAYSI.—This is the handsomest of the many forms of Phajus which botanically are only varieties of *P. grandifolius*, but which for horticultural purposes are accorded specific rank. It is flowering now at Kew for the first time, having been received two years ago from Fiji as "a distinct, probably new, *Phajus*, which I found in the woods here, and which has white flowers." In general characters it resembles typical *P. grandifolius*, the pseudo-bulbs being two inches in diameter, the plicated bright green leaves two and a half feet long and four inches wide, the erect scapes three and a half feet high, with sheathing bracts four inches apart and a dozen or more flowers in a compact raceme at the top. Each flower is four inches across, the sepals and petals equal in size, pure white outside, pale sulphur-yellow inside, the folded lip being white, with a faint tinge of yellow inside. The plant grows freely under stove treatment and potted in loose loam. There is a figure in the *Botanical Magazine*, 1873, t. 6032, of a plant imported from Queensland by Messrs. Veitch & Sons, and named in compliment to Mr. Bernays, of the Queensland Acclimatization Society. This plant is darker in color than that now in flower at Kew, and it is said to be a native of Queensland. In their *Orchid Manual*, part vi., page 11, Messrs. Veitch state that the plant flowered by them "is of little value as a horticultural plant on account of the flowers being often self-fertilizing before they expand, and thence lasting but a short time in perfection." All the flowers on the plant now in bloom at Kew are perfect in form, and the oldest flower has been expanded a week, and is still as fresh as the flower which opened to-day. In color it is quite distinct and delicately beautiful in the pale sulphur or primrose-yellow of the inner face of the segments. The type of *P. grandifolius* is not generally popular because its flowers are dull in color, a character which certainly does not belong to *P. Bernaysii*.

ALBERTA MAGNA.—A second plant of this south African Rubiaceous plant is now flowering in a greenhouse at Kew, and from it a picture has been prepared which will shortly be published in the *Botanical Magazine*. When calling attention to it in my letter of a few weeks ago I omitted to mention that, in addition to the brilliant red color of its terminal panicles of flowers, it has a second, and probably more lasting, attraction in its leaf-like calyx-lobes, which are spatulate in form, an inch long and colored bright red. When in flower the calyx-lobes are small and of uniform size, but after the flowers have faded one or two of the four calyx-lobes grow, and apparently assume as bright a color as the flowers. This character is not peculiar to Alberta, but may be seen in the allied genera, *Mussaenda* and *Howardia*. The Alberta is a handsome evergreen shrub. In flower it suggests *Embothrium coccineum*.

CACTUS VS. MAMILLARIA.—If we adopt the western proposal to substitute the name *Cactus* for *Mamillaria*, thereby limiting the use of the term now employed for the whole order to a single genus of that order, we shall, in consequence, be forced to invent a new family name. The term *Cactus*, as now used, has the same general meaning as have those of

Orchid, Fern, Palm, etc. We have Cactus societies, Cactus journals, Cactus shows and Cactus collections. What are they to do for a name? I argue the question solely from the standpoint of convenience, and I claim for the old arrangement the right to stand which long usage and suitability give it. *Mamillaria* is an excellent generic name, as it points out a character peculiar to the genus, namely, the mammae, or nipple-like tubercles which clothe the stem. It is not easy to persuade horticulturists to drop a well-established plant name, but I fancy you might as well ask us to find some other name for the Rose as to ask that we shall call a Cactus something else.

COLONIAL FRUIT.—Our horticultural and agricultural friends at the antipodes promise to supply the English market with fruit in as great abundance, and consequently as cheap, as the beef and mutton which now come from there. Tasmania announces that a shipment of apples for England will be made every week for thirteen weeks, beginning on February 25th, and that the grand total of cases intended for us will be close upon 200,000. We are also informed that a few thousand cases "only" will be shipped from Victoria and other Australian colonies. Three steamers, bringing large cargoes of fruit from the Cape, have lately arrived here, but owing to bad management much of the fruit arrived in an unsatisfactory condition. Grapes, peaches, nectarines, greengages, plums, melons, pears, apples and tomatoes were the principal consignments. I believe the chief cause of failure with such fruit as this is the cold of the "cool chamber." Shippers should try warmer and drier treatment for fruit grown under tropical or subtropical conditions.

W. Watson.

London.

Plant Notes.

The Cherokee Rose.

WE not long ago published a note on this Rose, and, indeed, we have often spoken of its attractive qualities, but it is one of those plants which it is difficult to overpraise. In one of the earlier volumes of *GARDEN AND FOREST* (see vol. i., page 235) there was an illustration of a hedge of this plant in Florida, with some of its long pendulous branches cut away to keep it within reasonable bounds. In the present number (see page 115) we publish an illustration of a flowering branch in which the quality of the individual flowers is brought out more clearly. The practice of spending a part of the winter in the southern states has become so general that most northern people are now familiar with this plant, but those who have never seen it can get a fairly good idea of the character of the flowers from the illustration, when it is remembered that they are considerably reduced, each one being two or three inches across, of a clear white, which appears to the best advantage against the dark evergreen leaves. The plant was naturalized in this country so early that Michaux pronounced it indigenous more than one hundred years ago. But, although we have no record when it was first introduced or how it broke away from the garden and made itself at home in Georgia and spread through the other southern states, botanists usually agree that it is an Asiatic species. It has become so thoroughly naturalized in the land of its adoption, however, that it is seen along the highways, forming high hedges which become at length lofty thickets twenty or thirty feet thick, and absolutely impenetrable. It is as much at home, in fact, as the wild Orange in Florida, or the Barberry on the New England coast. No more beautiful spectacle can be imagined than a long vista bordered with these plants, with their rampant growth and profusion of flowers.

Of course, the Cherokee Rose is tender in the north, and it is such a vigorous grower that it does not give much satisfaction as a pot plant. It is well worth setting out, however, in any large cool greenhouse, where it can be planted in a border in rich well-drained soil, and trained to

the rafters and walls. It needs full sunlight and all the air it can get during the warm weather, and, when once well established, it should be cut back almost as closely as a grape-vine. Hardwood cuttings taken in autumn will make a plant fit to set out in the open border the following June, and, if well grown, it will be large enough to flower the next January. Severe pruning will not be needed the first year, but, afterward, the old wood should be cut out every year in March or April to encourage new shoots, and it should always be well fed when it is growing. In its native state it blooms in April, but by proper pruning the time of flowering can be somewhat regulated, and it can be kept in bloom from January to March. Occasionally flowering branches of the plant are seen in florists' windows, but it would hardly pay here as a commercial plant, since it needs a long time to become established, takes a great deal of room, and then bears but one crop, and not a very long one, every year. It is, however, a most desirable ornament for any large cool house.

The illustration on page 115 is from a photograph by Miss Edith Eliot, of New Bedford, Massachusetts.

ASPARAGUS RETROFRACTUS ARBOREUS.—This plant, introduced to cultivation by Messrs. Lemoine in 1890, seems very distinct from other species of Asparagus. The stems are light colored, as large as a Rye straw, but solid and almost woody, the specimens we have seen under ordinary culture reaching a height of six or seven feet. The chief peculiarity, however, is in their so-called leaves, which are borne on numerous short side stems. These leaves are thin and are arranged in clusters like those of a Pine-tree. Their color is light green. The leaves are attractive and lasting for use in foliage effects with delicate flowers, and will be appreciated as a change even from the beautiful *Asparagus plumosus*. The plant would also be attractive for foliage decorations. Perhaps this species may not be readily increased so as to make it a plant of commercial value, but it will, we think, be appreciated in private greenhouses.

BIGNONIA VENUSTA.—Where one has plenty of head-room in a cool or intermediate house there is nothing better than this good old Brazilian plant for winter blooming. It begins to flower during the dull season, November and December, and continues until the middle or end of March; the warmer the house the earlier the flowers. They are borne in thick clusters in long pendulous racemes, often three feet or more in length, and are of good size and of bright orange-yellow color. Very few greenhouse plants show such immense and showy masses of bloom as this *Bignonia*. Unfortunately, the flowers are not very useful for cutting; they fade quickly unless they can be kept wholly or partially submerged in water; occasionally, however, they can be used with good effect in large decorations where they need last for an hour or two only. It is for greenhouse adornment that this plant is principally useful, where there is a back wall or high gable to be covered, or where a quantity of pendent vines will not interfere too much with the plants growing below. It should be planted in a well-drained border, in rough soil, rotted sods and peat, and care must be taken to keep the roots somewhat confined—that is, too much root-space is undesirable. The strong growth is during the summer months, terminating with the flowers in early winter. After flowering, the plant should rest; the leaves will fade and fall, and water must be given sparingly. The last of May, or in early June, a severe pruning should be given; all the new wood, now fully ripened, should be cut back to two eyes, unless it is desired to extend the amount of space occupied by the plant, when enough for such purpose should be saved. The weak wood should be removed, and any superfluous older stems cut out. Water should now be given, and the vine should be syringed daily. It will break freely and grow rapidly; any weak growths should be pinched out, and the stronger ones carefully trained, but never headed in, for it is on the ends of these shoots that the flowers will come. To check the

mealy bug, which is the only troublesome insect, the old stems need careful cleaning; the foliage should be washed frequently with hose or syringe up to the time of blooming. The propagation is somewhat difficult from cuttings, which should not be made of the very newest growths, but it is comparatively easy by layering in pots, using the new growths in August and September.

OSMANTHUS (OLEA) FRAGRANS.—This is one of the charming old-fashioned greenhouse plants for which the modern commercial florist apparently has little use. It is an evergreen shrub, a native of China, of rather slow growth, but not at all exacting in its requirements. Beginning in early December and continuing through March, it produces abundant clusters of small whitish flowers of most delicious and delicate fragrance, quite unlike the scent of any other flowers, and as difficult to describe as the color of a Saffron Rose. It is said that this flower furnishes the flavor used to scent orange Pekoe tea, a statement that can readily be believed, the fragrance is so oriental. It should

spring planting is often a necessity; the Japan Lilies, for example, have only recently been received.

Japan and China have contributed to our gardens to a surprising degree, and much that has been credited to Japan has probably come from China, but has been received through Japanese channels. But, whatever their original home, we should seriously miss them from our gardens, and our Lily-beds would suffer greatly if deprived of the species from the east. Some of these do not last long with us, as in the case of *Lilium auratum*, which we rarely hear of as thriving for more than a season or two at most. I have certainly never seen it established like the varieties of *L. speciosum*. A Lily more generally seen each year, as its good qualities become known, appears to be a natural hybrid between *L. auratum* and *L. speciosum*, and is known as *L. auratum platyphyllum*, or *L. auratum macranthum*. It would pass for the true *L. auratum* in all respects but for its broad foliage, which is quite as broad as that of *L. speciosum*, and the bulbs live and increase year after year, as do those of *L. speciosum*, in our gardens. This Lily is more expensive than some of the other kinds at first cost, but once purchased it does not need to be replenished, and it blooms regularly every season. Another good



Fig. 18.—A Flowering Branch of the Cherokee Rose.—See page 114.

be grown in a cool house and not overpotted. The drainage should be good, and when repotting is necessary the shift should be a moderate one in March or April. The soil should not be too fine, with some peat and plenty of sharp sand. The propagation is by cuttings of hardened wood in January and February. It is the best plan to keep the leaves entire, removing those only which interfere with the proper placing of the cuttings; neither bottom-heat nor glass coverings should be used.

Cultural Department. Lilies.

THE sooner work is begun in the outdoor garden the better it will be for many plants next summer. Many herbaceous plants begin to make root as soon as frost has left the soil, and this first start should, if possible, be made where the plants are to grow. This is especially true of Lilies, the fall planting of which is always desirable. But as a large proportion of the bulbs cannot be purchased until winter has set in,

hardy Lily is *L. Wallichianum superbum*, one of the most beautiful Lilies known, a native of the Himalayas. It promises to be popular, since it is easily propagated, rivaling the old Tiger Lily in ability to make young bulbs on the flower-stems at the base of each leaf, many of which will flower the second year. It is quite possible that we may yet see it grown in greenhouses as generally as the well-known *L. longiflorum*, which it resembles in some respects. The flowers are tubular, rosy-brown tinted outside, and white, with a rich yellow inside, that has given rise to the name *L. sulphureum*, which is now regarded as the correct name by authorities on Lilies. While this Lily has proved perfectly hardy in Massachusetts without any protection at all, it is better to give it the usual covering of dry leaves in autumn, as is the practice with other kinds.

Other new and beautiful kinds of Lilies of recent introduction are *Lilium Alexandræ*, said also to be of hybrid origin between *L. auratum platyphyllum* and *L. longiflorum*. If it is really a natural hybrid some time must elapse before it can be disseminated in any numbers. The new *L. Henryi*, a native of central China, with the form and rich red spots of *L. speciosum*, is of a uniform rich apricot-yellow in color. At Kew this fine

Lily is said to have proved hardy and strong, making stems over eight feet high, and producing as many as fourteen flowers on a stem. It increases rapidly under the same cultivation given to other kinds, and is, no doubt, a true species, having foliage resembling that of *L. speciosum*. This valuable acquisition suggests that the interior of China holds many beautiful plants desirable for our gardens as yet unknown to cultivation and to science. For *L. Henryi* we are indebted to Dr. Augustine Henry, who found it growing in two places only, near Ichang, on grassy slopes, at 200 to 2,000 feet elevation. The probabilities are that it will prove hardy in this part of the United States.

Among rare Lilies should be named *Lilium speciosum Mel-pomene*, a very richly colored form, perhaps the richest of all the varieties of *L. speciosum*. While it is rare in cultivation, other forms being substituted for it, it should not remain so, for it is not much more expensive than the others, costing about one-third more, and is far more beautiful. An importation of this sort is now daily expected, and we hope to have a fine group of this variety and the best of the white forms, *L. speciosum album praecox*. The latter make a good contrast, and flower about the same time, whether in pots or planted out in the borders.

Lilies which have been protected during winter must not be uncovered too early in April, and a little protection is necessary until all likelihood of frost is past. The young growing shoots are very easily injured by frost, especially if there is no protective growth near them, such as is furnished by a Rhododendron-bed. If the shoots are already above ground when the bed is uncovered they should be covered over with a handful of leaves and left to come through naturally.

E. O. Orpet.

South Lancaster, Mass.

Cannas.

THE advance of the Canna to its present position as an ornamental plant is one of the marvels of modern horticulture. Unlike the Star of 1891, which created a sensation when first introduced, Madame Crozy still remains among the indispensable varieties, and a large percentage of recent introductions are seedlings or derivations from this remarkable plant. The yellow border on its petals has given the cue to efforts in the direction of a pure yellow, and this seems to have been the aim of nearly all raisers of new varieties. Improved forms of Madame Crozy have been the result, but the type after all is probably the best. Its moderate height, handsome foliage and short compact spike make it the ideal. Improvements, however, have not been altogether on this type. In crimson we have Charles Henderson and Alphonse Bouvier; the former has the larger spike, finer flowers and dwarfer, sturdier habit. Alphonse Bouvier is an abundant bloomer, but is much taller; these two hold a superior rank in their color. Captain Suzzoni is the best yellow of the sorts that now can be called standard. It is not, however, a pure yellow, though the orange-red spots are so faint that for general effect it may be classed as such. Florence Vaughan is an elegant Canna as far as quality of flower and size of spike are concerned, but it is hardly a yellow variety, and should be classed among the spotted varieties. It has the finest yellow ground with scarlet spots of any Canna yet sent out. Captain Suzzoni as a winter bloomer is superior to Florence Vaughan, and in this respect it is equal to Madame Crozy. Taken from the border last autumn it has bloomed continuously all winter, and is now the brightest and best of any. Florence Vaughan received a check, indicating its relation to the older types, which needed some resting. Paul Marquant is a fine satiny salmon, free, and first-class in every way, especially as a winter bloomer. Paul Bruant is a beautiful orange-scarlet, large in flower and one of the first bloomers. This also has proved an admirable greenhouse variety this winter.

Among dark-leaved varieties, J. D. Cabos, with bronzy leaves and salmon flowers; Egandise, with crimson flowers, and the first bloomer of any, and President Carnot, the handsomest in foliage, make a beautiful trio. J. D. Cabos is hardly comparable with either, the glistening salmon-tinted flower contrasting beautifully with the metallic lustre of the foliage. These are the best varieties now in general cultivation.

In novelties every one is inclined to have favorites of his own. Last summer and autumn I made it a point to note the coming introductions. Eldorado will prove to be one of the finest yellow-flowered sorts this season. It has a large flower, as fine a spike and as good in habit as Madame Crozy, and it is practically yellow. It has some markings, but not enough to detract from the brilliancy or effectiveness of the flower. Every one who sees it is enthusiastic over it. It is very showy and must become popular. F. R. Pierson will probably be the best scarlet of the season. It bears an ideal flower, brilliant

in tone, with only a delicate penciling of pure gold at the centre of the flower, which seems to intensify the scarlet. The petals are very large, round, overlapping each other, reaching near what we must sooner or later obtain in this desirable class of bedding plants—a perfectly round flower. The Belle of Newport is, so far, the only pure yellow Canna. It is very dwarf, and in this respect promises to be of exceptional value as a bedder. It, however, lacks size, but, no doubt, it will be found valuable for hybridizing with the larger-flowered varieties, and may lead toward a new race of dwarf yellow varieties. The flower of the new so-called Butterfly Canna, Golden Wings, may be described as having a deep yellow ground, heavily blotched with brownish crimson. It will be a fitting companion to Queen Charlotte, a novelty of German origin—a scarlet, heavily banded with yellow. Both are beautiful and distinct, and especially adapted for effect when used with the darker-leaved varieties in masses. For bedding purposes, and especially for lines, Oriole will probably surpass any of the banded yellows yet introduced. Columbia is a novelty of American origin, and a very distinct break in character. The heads of bloom are most compact, deep cardinal-red, without any shadings; the spikes branch, and the flowers remain on longer than those of any other variety, a most valuable characteristic. Sunshine is much in the way of Paul Marquant, an unusually free bloomer, and bears the largest flower of any Canna I have seen. It has a soft, satiny lustre, and is not excelled by any of its color. Admiral Avellan I consider an improvement on J. D. Cabos, and this is saying a good deal. It is well worth a trial where a handsome bronzy-leaved variety, which is also a good bloomer, is required. General de Miribel is a good spotted salmon of splendid habit and fine large flowers, and Gladstone is a distinct and pleasing novelty with buff-colored flowers, bordered with yellow. Mrs. Fairman Rogers is a variety in the way of Madame Crozy, which has been honored with a silver medal by the Massachusetts Horticultural Society. The flowers are more heavily banded with yellow than those of Madame Crozy, but its principal value lies in the great size of its branched flower-spike. Its habit is dwarf, and promises to be the best of the Crozy type yet introduced.

T. D. Hatfield.

Wellesley, Mass.

Cut Flowers for Summer.

IN choosing the location for the cut-flower bed, when beginning garden work in spring, a good water supply should be considered, for during a dry season frequent and thorough waterings will be needed to insure an abundance of flowers. Among the plants readily procurable and particularly useful for this purpose are Bouvardias. Old stumps of these plants which have been in use in the greenhouse during the winter will answer well if cut back closely and allowed to break again before being planted out. The most satisfactory varieties are Davidsoni, The Bride and Elegans; the single varieties, as a rule, are the most floriferous. Stock plants of Heliotrope will also give a regular cut of flowers during the summer, and should be treated in the same way as the Bouvardias.

Carnations are apt to be somewhat scarce in the early summer, unless some of the plants of the former season have been kept over winter in a cold frame. Another plan is to keep the old plants in the greenhouse until outdoor flowers become plentiful. Successive sowings of China Aster should be made in order to prolong the flowering season, for, though these are rather formal flowers, they are useful and add much to the brightness of the garden. Successive plantings of Gladiolus bulbs will also provide good cut-flower material. For this purpose some of the older and less expensive varieties are useful, as, John Bull, Shakespeare, Princess of Wales and Brenchleyensis. Rather deep planting is required for these bulbs. From four to six inches is a good depth, but this may be varied according to the nature of the soil.

The first outdoor sowing of Sweet Peas should be made just as soon as the condition of the ground will permit. In some localities fall sowing is practiced with much success, but, whatever plan is adopted, an abundant water supply is essential to success in our hot summers, and, as is well known, the more the flowers are picked the more freely will they be produced, as the formation of seed-pods checks the growth of Sweet Peas.

Helianthus multiflorus and its double-flowered form are both useful in the herbaceous border and for cutting. Their brilliant flowers are highly decorative when tastefully arranged, and are not so coarse as those of many of the Sunflowers. Roses will naturally suggest themselves to every flower lover, and Marie Guillot, Papa Gontier, Marie Van Houtte, La France and Perle des Jardins are generally satis-

factory as outdoor flowers. A few plants of scented Geraniums should also be included in the cut-flower section of the garden. These will provide a plentiful supply of foliage for mingling with the flowers; for this purpose the varieties having finely cut leaves are most suitable, as most of the scented Geraniums are likely to make a rather coarse growth when planted out in good soil.

Holmesburg, Pa.

W. H. Taplin.

Phajus grandifolius.

THIS evergreen terrestrial Orchid is an old favorite, having been in cultivation for more than a century, and, although one of the first Orchids introduced into cultivation, it is still grown in almost every collection of these plants. The first specimens were brought into England from China, where it is a native, in the year 1778, by Dr. John Tothill. Some time afterward it was found to be a native also of the lower Himalayas, Cochin China and eastern Australia.

The plants now growing here were collected by me three years ago in the mountains of Jamaica, where *Phajus grandifolius* is abundant. Although so plentiful there, I was told that it is not a native of that island, but was introduced about a hundred years ago, and has become thoroughly naturalized. It is found there at elevations ranging from 1,000 to 5,000 feet. I found the largest and strongest plants at an elevation of about 3,500 feet. They grew in rich loam in an open space which looked as if it had been a garden at one time, and they were unprotected from the hot tropical sun. In the same piece of ground *Bletia Shepherdii* grew plentifully.

Phajus grandifolius has ovate pseudo-bulbs, and these when well grown are the size of a large Hyacinth bulb and are sheathed by the imbricating bases of the fallen leaves. The large, dark green leaves are oblong-lanceolate and thirty to forty inches long. Our plants are grown in nine-inch pots, and there are seven or eight flower-spikes to each pot. Many of the spikes are four feet in height and carry twelve to sixteen flowers each. The flowers are four inches across; the sepals and petals oblong-lanceolate, yellowish brown on the inner side and silvery white on the outside. The projecting lip is of a tubular shape, about an inch and a half long, white, with a dark crimson-brown throat. These plants are easy to grow and flower, but if large, well-flowered specimens are desired they require attention and care. The plants should be repotted in spring when they are beginning new growth. They flourish in a compost of fibrous loam, leaf-mold and a small quantity of dried cow-manure. During the growing season they like a warm, moist atmosphere and plenty of water at the roots, and occasionally a little weak liquid-manure. They do well in an intermediate house during the summer, and when the leaves are fully grown they should have cooler treatment and they will then need less water.

Harvard Botanic Garden.

Robert Cameron.

A Few Annuals.—III.

MENTION should be made of the so-called Everlasting Flowers, which are curious and sometimes quite pleasing. Their vogue in cemetery wreaths and bouquets of dyed and bizarre grasses has somewhat abated, and funereal associations have, perhaps, been the occasion of their waning popularity; but a few of them are ornamental in a garden, and they are by no means to be despised when dried and tastefully arranged in vases, especially if fresh flowers are scarce. The prettiest of the Everlastings are the *Acrocliniums* and *Rhodanthes*.

Many climbers are useful in furnishing cut flowers as well as ornamental in the garden, where they can be made to cover bare spaces quickly and effectively. As merely ornamental plants they vary greatly in value, and the annual climbers are not as valuable as the hardy ones, with which a garden can in time be more satisfactorily furnished. Of tender vines, after Sweet Peas, which have already been noted among the best annuals, the Morning-glories, of course, easily lead all others in popularity. *Ipomoea major*, the ordinary form, has seeds which will grow for any one, and which it will in time distribute only too generously. As can be seen in any catalogue, there is a great variety of *Ipomoeas*, many of which are beautiful, and yet have seeds which, fortunately, are not so hardy. The so-called Heavenly Blue, which is the old *Ipomoea rubrocœrulea*, is one of the most desirable. The night-blooming kinds are curious, and may sometimes be seen open on cloudy days. The *I. (Mina) lobata* is scarcely worth growing, since it is uncertain in flowering, and the flowers, when they do appear, are of unsatisfactory color. *Mina sanguinea* is better, having bright scarlet flowers, which are borne very freely, and will be welcomed as a change from Cypress-vines (*Quamoclit*), whose

usual supports of strings and hoops are so prominent in some gardens. Many of the *Ipomoeas* flower shyly, but all are very prolific of foliage. The Allegheny-vine, *Adlumia cirrhosa*, is a native plant of great beauty. It is perfectly hardy, a biennial, which during the first year has a Fern-like effect. The second season it runs freely and produces very pretty small, nearly white, flowers. It is more attractive, however, without the flowers, which soon fade, and give a ragged effect to the plants.

The *Cobæa* usually proves one of the most satisfactory annual vines, as it produces most effective large flowers. The flat seeds are easily ruined in the seed-bed if carelessly watered. However, if planted on edge and carefully tended in a temperate atmosphere, they will germinate safely and grow away rapidly.

Thunbergias are very pretty in gardens, especially when allowed to grow untrained. Their hard seeds germinate slowly, and they require strong heat.

Maurandia Barclayana is the prettiest of the delicate or small-foliaged vines. As it has fair-sized handsome flowers, which it produces very freely on the rapidly growing stems, it may be rated as the best of the smaller annuals.

Climbing *Nasturtiums* cannot be spared from any garden, but these have been listed among the best annuals. *Humulus Japonicus*, Japanese Hops, may more readily be omitted from the garden, unless some wild place is to be covered by a rapidly growing vine which will surely replace itself by seeds, and these it produces in myriads. I do not know of any plant, unless it is the *Centaurea* and *Petunia*, which distributes its seeds so uniformly over a garden, and every one of them seems to germinate. Yet I have known people for whom Japanese Hops would not grow.

If one has available space in the back garden, an assortment of Fancy Gourds will be found very interesting, especially to the younger members of the family. Their quick growth is of daily interest, and the fruits are so pretty or curious or grotesque, as to make the fruiting time one to be pleasantly anticipated.

Elizabeth, N. J.

J. N. Gerard.

Celosias.—These useful plants of the summer months can be grown by any one who will give a reasonable amount of attention to them. *Celosia plumosa* and *C. cristata* are both well worth growing, as they are so useful for cool greenhouse, conservatory or terrace work. In the latter place they will stand a long time, and their showy appearance always attracts attention. Seeds of a good strain are especially needed in growing these plants. Good seeds will germinate in any fairly light soil if placed in a good moist heat. It is best to cover the pan with a piece of glass until the seed is up. As soon as the plants are large enough to be handled they should be pricked off into flats, but kept in a brisk heat, as they should not receive any check after they are once started. As soon as they are large enough they should be potted into four-inch pots, preferably in a rich compost of loam, leaf-mold and cow-manure in equal parts. At the last, six-inch pots should be used for plants of *C. cristata*, and a size larger for *C. plumosa*. I use a little commercial fertilizer, for they are vigorous feeders and must have plenty if they are to form fine heads. They should be kept in a moist heat to protect them against red spider, and the heat of a slow hot-bed is just the place for them, as the glass keeps them dwarf.

Different strains of the *Cristata* type show the combs at different periods, some when in small pots, others after the last potting, and some of the best heads are formed from these. This is a good time to sow seed, and some may be sown later to give a second lot. With a minimum temperature of sixty-five degrees and plenty of moisture and manure strong plants will be assured.

South Lancaster, Mass.

W. Downs.

Correspondence.

The Hardiness of the Rose Crimson Rambler.
To the Editor of GARDEN AND FOREST:

Sir,—I have been much interested in what you have said about the Rose Crimson Rambler at various times for several years past, and now that American dealers have plants on sale I should like to inquire whether the experience of the past winter has proved that they are hardy?

Babylon, L. I.

S. A.

[It is too early to answer such a question definitely. Plants may survive one year, even a very severe one, and yet fail at another time under apparently less trying circumstances. We have inquired of several of the firms who

advertise the Crimson Rambler in our columns, and, so far as we have learned, the probabilities are that the plant will prove hardy. Messrs. Ellwanger & Barry write that plants of this Rose which have been out-of-doors all winter with the same protection that is given to other hardy Roses prove to be in first-class condition now, in the middle of March, having borne the winter as well as any others. It is further said that some of the tips of the Crimson Rambler which had not been covered at all have escaped so far without the slightest injury, which indicates that some kind of winter protection is given. Mr. A. Blanc writes that some of their plants of the Crimson Rambler have been left out at West Grove, Pennsylvania, all winter, and have so far withstood the severe weather without any apparent injury. Mr. Patrick O'Mara, of Peter Henderson & Co., reports that they left out four plants of this Rose, one on each of the four sides of a house in Hackensack, New Jersey, so that the plant could be tried in every exposure. Both the wood and the buds of these plants are still plump and perfectly sound.

It is to be hoped that these prophecies of hardiness may prove true, because large plants of this Rose when in bloom, as we have seen it in England, are objects of striking beauty. Even if it should not prove quite hardy, it would be very valuable for conservatory decoration.—ED.]

Some New Hybrid Roses.

To the Editor of GARDEN AND FOREST :

Sir,—A few days since I received a box of charming roses from Jackson Dawson, of the Arnold Arboretum. As these were new hybrids and most promising, a few notes of them ought to interest those who appreciate the value of Roses which are useful for other purposes than the mere furnishing of cut flowers. These Roses are all from stock of *Rosa multiflora*, or rather they are seedlings of the delightful Dawson Rose, a cross between *R. multiflora* and General Jacqueminot, fertilized by pollen of Madame Gabriel Luizet and General Jacqueminot.

Of the flowers sent me, I was especially attracted by one which was a most exquisite little one, no larger than *Rosa multiflora*, but double, very fragrant, and a clear, light rosy pink color. Its pollen parent is Madame Gabriel Luizet, and it seems of the same habit and free-flowering character as *R. multiflora*. I can imagine no more beautiful floral sight than a trellis covered with a plant of this in bloom. There were others, double and semi-double, ranging from the color of Apple blossoms, through various shades of rose to a clear dark cerise. In size they vary from the small flowers noted above to some two inches in diameter. Judging from the flower-sprays, there appears to be the same variation in their habits as there is in the quality of their perfume.

These Roses received a silver medal last June from the Massachusetts Horticultural Society, and they are sure to be valued by those who have been awakened by the beauty of the more simple flowers of the species which are now finding favor in the best gardens.

Elizabeth, N. J.

J. N. Gerard.

Market Flowers in Private Gardens.

To the Editor of GARDEN AND FOREST :

Sir,—I am much interested in your reports of the Carnation exhibition in Boston. That a society should be devoted to the development of a single flower; that meetings should be held to discuss the merits of its different varieties, to compare the results of different methods of propagating and cultivating it, and to listen to learned dissertations on its fungous enemies by scientific experts; and that exhibitions consisting of these flowers almost exclusively should attract crowds of visitors—all these are novelties in the history of American floriculture, and they certainly promise to instruct the public on every essential point which the growers of Carnations need to know. We sometimes hear certain flowers sneered at as fashionable, but a flower is not likely to gain such a position unless it has genuine merit. Certainly the Carnation excels in many ways. It has bright color, attractive form and exquisite fragrance. It has foliage, too, which heightens the effectiveness of the flower, and I confess to some feeling of surprise that in the reports of all your correspondents I saw not a word about the foliage as a part of the beauty of the plant. A flower with a

stem as stiff as a lead-pencil and two inches across was sure to get commendation, while everybody knows that a Carnation flower is never so beautiful as it is when seen in connection with its own leaves, and the leaves of some varieties are much more effective as a foil and setting to the flower than others.

Perhaps the reason of this is that Carnations sell without regard to their foliage, and it is not surprising that commercial growers should devote themselves to supplying what people are willing to pay for. They do business with the same motive which impels other business men, and it is right that profit in business should be their original aim. We often hear flowers grown by florists spoken of contemptuously as something inferior to those grown in private places, but it is very plain that a different purpose ought to rule in a commercial establishment and a private establishment. All the efforts that florists are making to produce flowers of the greatest substance and lasting power and availability for their particular use is commendable. If it will pay them to grow nothing but Carnations, and even only one variety of Carnation, this is the one thing they ought to do. But is this quite the best way to manage a private collection?

This is just the point to which my long preamble is tending. While it is undoubtedly the proper course for a commercial grower to grow the few things that will sell, one would think that a man with a private collection would derive greater satisfaction from growing a variety of plants. Certainly he will not get the greatest enjoyment out of his garden if he devotes it mainly to flowers which can be bought in the nearest florist's shop. There are scores of plants which have a beauty so delicate that it makes them unprofitable to sell either as plants in flower or as cut flowers, and one cannot help but feel that the place to find such things is a private collection. One can go to a commercial establishment and thoroughly enjoy half a dozen houses full of Carnations and admire the skill with which they are cared for. In the same way, long houses filled with Roses for market are interesting to every flower-lover, but why a man with a range of greenhouses for his own enjoyment should have in them little else than flowers which can be bought on a street-stand is surprising.

While the quality of florists' flowers is growing better year by year, it has sometimes seemed to me that the quality of the collections in private glass houses and private grounds is deteriorating in variety and growing less and less interesting. Of course, it is hard to prove such a statement, and the natural reply to it is, that, as we grow old, memory throws a rosy halo over the past and glorifies all we saw in youth, while if we could see the real thing now it would look much less attractive than the imaginary one does in our musing moods. But I think I can remember fine old places along the Hudson and in the suburbs of Philadelphia and Boston where there were once collections of beautiful hardwood plants, and the same houses now are filled with soft stuff to furnish cut flowers. In fact, there are many choice old plants which I hardly know where to look for in these days. Once we used to see plants which were not rare or hard to secure, but which were grown into such magnificent specimens that they compelled admiration simply for their size and luxuriant vigor. We now see fine Palms and Cycads, Dracænas, and the like, and often they are crowded together in such a way that the individuality of every plant is lost, and the house looks like a tropical jungle. But there is a generation of Americans growing up who have never seen a well-grown Fuchsia, for example. What I am trying to say in a roundabout way is that whether it be the fault of owners of plant collections, or of their gardeners, these private places are wasting their opportunities in trying to compete with florists in growing florists' flowers, and that where these great private gardens are devoted to anything besides the furnishing of cut flowers, they do not so much seek to attain what is beautiful as that which is odd and expensive.

R. A. Weyman.

Syracuse, N. Y.

Jasminum nudiflorum.

To the Editor of GARDEN AND FOREST :

Sir,—From this latitude southward, where *Jasminum nudiflorum* will survive our winters in the open air, it almost always shows some flowers with the warm days of early March. So far, however, not a bud has expanded. We have potted plants in cold storehouses which are now beautifully in flower. We often use this plant as a climber among other vines in pots, and we invariably get a fine display from it in February and March. It might be used in this way to advantage much oftener than it is now.

Joseph Meehan.

Germantown, Pa.

Recent Publications.

The Silva of North America: A Description of Trees which Grow Naturally in North America, exclusive of Mexico. By Charles Sprague Sargent, Director of the Arnold Arboretum, Harvard University. Illustrated with figures and analyses drawn from nature by Charles Edward Faxon. Volume VII. Lauraceæ-Juglandaceæ. Houghton, Mifflin & Co., Boston and New York. 1895.

The purpose of this work and the way in which it is being carried out are both so well understood, that it is only needed here to glance at the contents of this volume to show that our rich forest flora continues to sustain the interest in the subject which was aroused by the appearance of the first volume. In addition to the great Laurel Bay of California, Umbellaria, the Perseas of our southern Atlantic and Gulf coasts, and several other species of comparatively limited range, such well-known trees as Sassafras, four species of Elm, two of Hackberry, two of Mulberry, three Sycamores, four Walnuts and eight Hickories are described in this volume. Of the fifty-four plates, from drawings by Mr. Faxon, it only needs to be said that they continue to show that accuracy and refinement which place them in the very front rank of work in their class.

The Florida Sketch-book. By Bradford Torrey. Houghton, Mifflin & Co., Boston and New York.

This is a reprint of a series of papers written for the *Atlantic Monthly*. Their aim is simply to embody Mr. Torrey's recollections of a pleasant vacation tour, part of which was spent in the wilds of eastern and southern Florida, part in the hilly region in the northern part of the same state. The writer visited Florida for the purpose of studying the birds of this semi-tropical region, and of contrasting their habits with those of the same and kindred species in their New England home. The subjects are such as would suggest themselves to a naturalist while exploring new fields, but the treatment is individual, and the whole book has a delightful atmosphere and reflects throughout the charm of a happy personality.

It is refreshing, in these days, when there seems no end to the making of Nature books, to come upon some unpretending little volume like *The Florida Sketch-book*, which displays on every page the clear vision of the true observer. For Mr. Torrey's touch, though light and often playful, as should be the touch of one who writes in holiday mood, is always firm and true and sometimes exquisitely tender. Underlying the bright fancy and gay humor, which are characteristic of his attitude toward Nature, is a solid base of accurate knowledge, combined with a delicate appreciation of every phase of natural beauty. He has, moreover, something of the poet's gift—that perceptive sympathy with the life of Nature, which is as incapable of analysis as the color of the rose or the perfume of the violet, and which separates by a narrow though impassable gulf the record of the true interpreter from that of the mere "suburban reporter." This gift manifests itself with as much certainty in some apparently careless allusion to the habit of a flower or the ways of a bird, as in the formal word-painting of a landscape. And, although Mr. Torrey may not have realized Thoreau's ideal description of a flower, so that he can reveal what the child sees in it to admire and love, he often, by a delicate imaginative touch, establishes at once some subtle sympathy between the reader and the inhabitants of the woods or fields. Thus, when he speaks of the Mullein stalk as "presenting arms along the roadside," the soldierly bearing of the plant is given at a single stroke, and when he characterizes the Partridge-berry as a "Yankee in Florida," we feel the breath of northern woods in the monotony of the Pine-barren.

In Mr. Torrey's interpretation of bird-life we find the same full sympathy. Sometimes it is revealed in an elaborate study of an individual, as in his description of the omnipresent great blue heron, familiarly known as "The Major," which is always at home near the water, and there

is water everywhere in Florida. "On the beach, as everywhere else, the heron is a model of patience. To the best of my recollection I never saw him catch a fish there; and I really came to think it pathetic, the persistency with which he would stand, with the water half-way to his knees, leaning forward to the breakers, as if he felt that the great generous ocean, which had so many fish to spare, could not fail to send him at last the morsel for which he was waiting." No reader can forget the happy phrases in which the tree-top flirtations of the flickers are described; we fairly tire of the monotonous music of the tufted titmouse, which pipes on and on without rest or variation, "as if his diapason stop had been pulled out and stuck fast"; and we at once appreciate the preternatural gravity of the pelicans when we are told that the writer could never see even a single pair of them going by in Indian file "without feeling as if he had been to church."

Though the object of Mr. Torrey's tour in Florida is to study the manners and customs of his feathered friends in their southern environment, no sooner does he enter the land, where it is always afternoon, than, in spite of his Puritan inheritance, he yields to that delightful southern insouciance "which takes life as made for something better than worry and something pleasanter than hard work." And he confesses with charming frankness that the pleasantest of all his Florida memories are of the occasions when, forgetting all his botany and ornithology, "he climbed the hill in the cool of the day, and after an hour or two spent on the plateau strolled back again, facing the sunset through a vista of moss-covered Live Oaks and Sweet Gums." One hardly knows where to stop when beginning to quote, and we might continue for pages to show how all the air which rests upon this half-tropical scene is filled with leisure and languor; but Mr. Torrey cannot divest himself even in this golden land of the influence of his New England inheritance and discipline. The quiet and incurious hours, which are so delightful to recall, owe their very fullness of enjoyment to the acute powers of observation which have been trained to act with automatic precision by many a vigorous tramp, with open eyes and alert senses, over New England hills. It is his deep love for his northern home and his familiarity with every phase of its varied beauty which enable him to interpret with so much poetic feeling the vague and evasive charm of the southern landscape. "A Yankee in Florida" might well serve as a subtitle to his little book, for he never forgets New England's woods and hills. Sometimes in a felicitous phrase he contrasts the characteristic features of the northern and southern landscape, as when he remarks that the "pine wood-sparrow does for the southern Pine-barrens what the field-sparrow does for the northern berry pasture." Sometimes the contrast is instructive, as when writing of the unconfined beauty of the road borders, he says: "The southern highway surveyor, if such a personage exists, is evidently not consumed by that distressing puritanical passion for 'slicking up things,' which too often makes his northern brother something scarcely better than a public nuisance. At the south you will not find a woman cultivating a few exotics beside her front door, while her husband is mowing and burning the far more attractive wild garden that nature has planted just outside the fence." Or, perhaps, the reminiscence is full of tenderness, as when in the course of his journeys he comes upon a solitary hermit-thrush in the thicket, as he occasionally did, and not one of them ever sang a note. "Probably," he adds, "they did not know that there was a Yankee in Florida, who, in some moods, at least, would have given more for a dozen bars of hermit-thrush music than for a day and a night of the mocking-bird's medley." The book is delightfully free from any effort to point a moral, but it again demonstrates that the more one loves his home and the more intelligent is the delight he takes in its natural beauties, the more profound is his sympathy with the novel phases of nature in remote and strangely different regions.

Notes.

Mr. Hamilton Gibson has been invited to give his illustrated lecture on the Fertilization of Flowers before the next annual meeting of the American Florists at Pittsburg.

Mr. J. H. Hale writes to the *Florists' Exchange* that he could find in his orchards last year, where no special cultivation had been used, smooth and fair specimens of the Crosby Peach eleven and a half inches in circumference.

The frontispiece of the *Popular Science Monthly* for March shows a fine portrait of Thomas Nuttall, the famous explorer and botanist, whose *Genera of North American Plants*, published in 1818, moved Dr. Torrey to declare that "it had contributed more than any other work to the advance of the accurate knowledge of the plants of this country." The portrait is accompanied by an attractive sketch of Nuttall's diversified, adventurous and prolific life and of his singular personality.

Antirrhinums are useful border flowers, usually hardy here, and white sorts are especially desirable. At the last meeting of the New York Florists' Club, Mr. W. R. Wood, of West Newton, Massachusetts, exhibited a vase of large pure white flowers, which were said to be a variety of *A. majus*. The long stems, well furnished with unusually large flowers of perfect purity of color, were most attractive. If this variety flowers as freely as ordinary Snapdragons it ought to be a desirable addition to greenhouse collections.

During the past winter California escaped those periods of cold weather which were so disastrous to fruit-growers in many parts of the world, but at the close of last week there was heavy frost in the Sacramento and San Joaquin valleys, which did great damage to the apricot, almond, cherry, peach and prune crops, as the trees were still in blossom or the fruit had just set. As the Sierra Nevada and Coast Range were both covered with snow, it was feared that the frosts might continue for several nights.

Mr. Jackson Dawson, of the Arnold Arboretum, has raised a hybrid with *Rosa Wichuraiana* as the seed parent and *Rosa rugosa* as the pollen parent. The plant has the perfectly prostrate habit of *R. Wichuraiana*, lying flat to the ground, but with the vigorous constitution of *R. rugosa*, and large, deep green glossy leaves. The flowers are single, nearly as large as those of *R. rugosa* and of a clear rose-pink color. If it had no flowers whatever the lustrous leaves and vigorous habit of the plant would make it desirable.

Occasionally vessels from the south of Europe bring over small numbers of what are called nut-cones. They are really the cones of *Pinus pinea*, in shape and general color resembling somewhat a small pineapple. When brought into some warm place, as, for example, near a steam radiator, the scales quickly begin to reflex, commencing at the base, and turning back release the piñons or edible seeds. The motion of the scales as they open is so rapid as to be plainly visible, and is quite interesting to people who have never seen the spectacle, and this exhibition gives a value to the cone apart from the nuts which it contains.

Dr. Peters, of the Botanic Garden of Gottingen, has been experimenting with seeds taken from different depths of soil in a dense wood from 100 to 150 years old, which had been arable land for many years before it became woodland. His object was to discover how long the seeds of weeds would retain the power of germinating after they had been buried in the soil to a depth where they could not sprout. Soil samples were taken at various distances from the surface to the depth of a foot. These samples were placed under genial conditions, and the seeds which germinated were raised and cultivated to a flowering stage. Although the land had ceased to be arable between 300 and 400 years before, the weeds of cultivation were abundantly represented, and Dr. Peters claims to have proved that the seeds of many field and pasture plants retain their vitality considerably more than half a century.

A summer school of forestry, continuing from the 8th of July until the 10th of August, is to be held under the auspices of the American Association for the Advancement of Education, at Avalon, New Jersey, fifteen miles north of Cape May, on the coast. A large part of this island is covered by forests of Oak, Cedar, Pine and Holly, and there are remarkable dunes which show the effect of drifting sand. The director of the school will be Mr. John Gifford. Dr. Charles Dolley is the lecturer on Zoölogy in relation to Forestry; Dr. T. N. Lightfoot lectures on Geology in relation to Forestry; Dr. S. Egbert lectures on Forestry in relation to Health; Albert B. Entwistle lectures

tures on the Uses of Woods. Students to the school of forestry, for which a fee of \$10.00 will be charged, are admitted to the courses of the Assembly in Natural Science free.

From the twenty-sixth annual report of the Park Commissioners of West Chicago, it seems that the parks in that city are suffering from the same abuses of which the Park Board of Buffalo complain. It is said that visitors make walks across the turf and mutilate the plants. There is no cure for such a state of things except a more elevated and refined public sentiment. A community which allows the beauty of its public grounds to be trampled out so far proves itself lacking in certain elements of civilization. The people who are helping to devastate the Chicago parks, the wealthy men in this city who have tried more than once to turn Central Park into a trotting-course, the wheelmen and horsemen who are endeavoring now to confiscate a part of the Buffalo park system for bicycle tracks and speedroads, all belong to the same class. They are not intentionally public enemies. The trouble is they are not yet completely civilized.

Mr. G. F. Scott Eliot, who left England in September, 1893, on a botanical exploration of Mount Ruenzori and the country north of Albert Edward Nyanza, has just returned, and at the last meeting of the Linnæan Society gave an interesting account of his journey. The country north-east of Victoria Nyanza is described as a rolling plain, fertile and grassy, 6,000 feet above the sea, while Mount Ruenzori, where he spent four months, reaches an altitude of 18,000 feet. The sides of the mountain are clothed at the base with a thick growth of trees resembling the Laurel of the Canary Islands, above which are Bamboos to the level of 10,000 feet, and above that again a substance which the explorer could only liken to a Scotch peat moss into which he would sink at every step for a foot or more. Among the plants he saw were a gigantic Lobelia five or six feet high, Hypericums resembling those found in the Canaries, Violets and Cardamines. Large trunks, like those of *Erica arborea* of the Canary Islands, but indicating trees eighty feet high, were also seen. In addition to a large collection of dried plants, Mr. Scott Eliot brought home and presented to Kew a collection of living plants, including various bulbs and Orchids.

The main dependence for potatoes this year is the domestic crop, which is in striking contrast with the condition of the supply of this staple a year ago. Since October 1st 730,000 barrels of home-grown potatoes have been handled by New York wholesale dealers, 230,000 barrels more than were received here in the same period a year ago. In the same months during the present season only 60,000 sacks of European potatoes came into this port, whereas above 338,000 sacks from Great Britain and the Continent passed in during this period last season. Nova Scotia, Prince Edward Island, Cuba and Bermuda are also minor sources of supply. Potatoes from Bermuda cost fifty cents a half-peck; parsley from the same islands brings seven cents, and beets twelve cents a bunch, while heads of Romaine lettuce cost twelve cents each. Cuba still sends egg-plants, okra, peppers and onions. String-beans from the southern part of Florida are a scarce luxury, and cost the unusual price of a dollar a quart. Small lots of tender and crisp lettuce from Florida find ready sale at good prices, and the first cabbage from that state has been quickly bought up by dealers in choice vegetables at \$4.00 a barrel, as high a wholesale price for this quantity as is asked for one hundred heads of northern-grown winter cabbage. Danish cabbage has advanced to \$10.00 and \$12.00 for a hundred of the firm, large, white heads. Tomatoes from Key West and Havana come in varying grades; those of ordinary quality may be had as low as fifteen cents a quart, the better-colored and more delicate ones costing thirty cents a pound, while choice hot-house tomatoes of uniform size and rich color command eighty cents a pound. The first Charleston asparagus costs \$2.50 a bunch. Kale, chicory, spinach and escarole, from Norfolk, are moderately abundant. The only green peas now offered here are the few coming from California, and these cost seventy-five cents a half-peck. The last California cauliflowers sell for fifteen to thirty-five cents a head, and the smaller and whiter hot-house cauliflowers bring thirty-five cents each. Hot-house radishes cost five cents a bunch, and tender young carrots the same price. Rhubarb, from Long Island, is ten cents a bunch, mushrooms seventy-five cents a pound, and Boston cucumbers twenty cents each. Among winter vegetables Brussels sprouts cost twenty-five cents a quart. Half-a-dozen roots of long, well-blanced Rochester celery cost fifty cents; the smaller celery from New Jersey commands half that price. Choice Vineland sweet-potatoes cost fifty cents a half-peck.

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLES:—The Winter Aspect of Trees. (With figure).	121
The Work of Women in Village Improvement.	121
Trees of Minor Importance for Western Planting.	121
FOREIGN CORRESPONDENCE:—London Letter.	W. Watson. 123
PLANT NOTES.	124
CULTURAL DEPARTMENT:—Vegetables for Private Gardens.	S. A. 126
Flower Garden Notes.	E. O. Orpet. 127
Hints on Potting Orchids.	William Scott. 127
Chrysanthemums.	T. D. Hatfield. 127
CORRESPONDENCE:—Bordeaux Mixture and Color Tests.	Professor S. A. Beach. 128
Forest Fires in Minnesota.	H. B. A. 128
RECENT PUBLICATIONS.	129
NOTES.	129
ILLUSTRATION:—Beech-tree in South Hingham, Massachusetts, Fig. 19.	125

The Winter Aspect of Trees.

IN the eyes of those who have genuine love for them, trees do not lose their beauty when their leaves fall; and, indeed, for such persons they have an especial attractiveness in the dreariest season of the year. We often hear the coniferous trees, which hold their foliage all the year through, praised for their value in a winter landscape, but deciduous trees, whether taken singly or in groups, have also their uses in the scenery of this season when they reveal beauties which are at other times unseen. There are no richer colors in a winter landscape than the warm browns of a distant wood, and there is nothing for delicacy of tint to match the faint mist of color that hovers above a thicket, a sort of a haze—it may be of violet or rose, or soft gray—composed of the mingled colors of the various twigs in the shrubbery. But, aside from the beauty in color and form of trees in mass, individual deciduous trees never display in perfection the dignity and grace of their framework until after their covering of leaves has fallen, and they then reveal to the careful observer the reason for many of their most striking peculiarities when in full leaf. For example, the attitude and gesture of different trees are quite distinct when under the stress of a high wind. This depends upon the way in which the branches bend and recover in the gale. In the winter one can readily see how the long slender branches of a Sugar Maple, most of which stand out at equal angles from the central stem, will sway in a different way from the sturdy and horizontal limbs of an Oak. We can see, too, how a tree with large and widely separated limbs, like some of the Oaks and Chestnuts, will have the grandeur which comes from an alternation of deep shadows and strong lights, while another tree, like an Ash or a Maple, before it acquires a strongly individual expression with age, will have a smoother and more sunny surface, in which the idea of gracefulness predominates over that of sturdy strength.

Of course, there are details of the color and texture of the bark of individual trees and the arrangements of their spray which can best be studied in winter. The Beech is one of our native trees whose winter aspect is particularly pleasing. Gilpin, in his classical work on *Forest Scenery*, is inclined to deprecate the picturesque value of the Beech;

he pronounces its skeleton deficient in strength and firmness, the branches at the best being disproportioned, awkward and fantastically wreathed, while the bushy spray gives it a disheveled look. He admires, however, the trunks of old specimens when "they are studded with bold knobs and projections, and have sometimes a sort of irregular fluting, which is very characteristic." There are no American Beeches which have been so long pollarded as the famous Burnham trees, which are so impressive for the size of their hollowed trunks, even after the maltreatment which they have suffered. But we are inclined to think that the American Beech is a more impressive tree than the European, although the latter is strikingly beautiful, especially in youth. An old American Beech-tree certainly has dignity of form, and the bark is even more beautiful than that of the European Beech. It has a smoothness of texture unexcelled by the bark of any other tree, and a blue-gray color which looks still more clean when contrasted with the red-brown and abundant spray. Thoreau notices two of the most beautiful characteristics of our Beech when he says "no tree has so fair a bole or so handsome an instep as the Beech"; for the sturdy way in which the great roots curve out to grip the soil is noticeable in every well-grown tree. In a note in one of his journals in early winter, Thoreau also speaks of the thick, inviting bed which the fallen leaves of the Beech make on the ground: "Beautiful, perfect leaves, unspotted, not eaten by insects, of a handsome clear leather color, like a book bound in calf, crisp, elastic, covering the ground so cleanly as to tempt one to recline on it and admire the beauty of the smooth boles from that position, covered with lichens of various colors. The trees impress you as full of health and vigor as if the bark could hardly contain the spirit, so that it lies in folds about their ankles like the wrinkles of fat in infancy."

The illustration on page 125 gives an excellent idea of the proportions of a Beech-tree which has reached mature age, and of the peculiarities of its ramifications, although it is at too great a distance from the observer to show the quality of its bark. This particular specimen has a trunk girth of nine feet and a half six feet from the ground, and its branches cover a circle sixty-five feet across. It stands in South Hingham, Massachusetts, and we are indebted to the kindness of Mr. F. W. Brewer for the photograph from which our illustration is made.

The Work of Women in Village Improvement.

AMERICAN villages are not always desirable places of residence. With proper attention many of them could probably be made more healthful, and certainly more beautiful—or less repulsive—and they could be so organized as to offer their inhabitants greater social and educational advantages. That the well-being of all who live in country villages could be promoted if more thought and labor were given to their sanitary condition and general appearance is an evident truth, and it was to better these fundamental conditions of life that village improvement societies were originally founded, although from the very outset the originators of the movement conceived the still broader purpose of stimulating the love of nature and the development of artistic feeling.

Now, it is true that many of these associations have not fulfilled the sanguine hopes of their originators. Many of the promoters of the movement enlisted in it with no definite idea of what was to be done, no realization of what was important and essential in the project, no adequate knowledge, no artistic feeling, no genuine love of nature. Sometimes there was a lack of earnestness and enthusiasm, and this meant a lack of money to carry on the work. Sometimes there was zeal without knowledge, and this meant too many trees planted, or trees planted in the wrong place, and the invariably fatal results where work which can only be done by an expert is entrusted to a journeyman. And yet the majority of these societies have justi-

fied the wisdom of their founders, and there are many villages in the country which owe to them a good water-supply and sewage system, a general air of thrift and neatness, with improved roads and sidewalks, shade-trees, sprinkled streets, tree-embowered public squares and school-grounds. In many of these villages the railroad station and its well-planted surroundings prove a most favorable introduction to the stranger, who will see nothing to offend the eye in the way of rubbish heaps, tumble-down fences or obnoxious advertisements.

The movement is not dead or dying, and it is worth the attention of any one who lives in a small town, and therefore all such persons will do well to read Mr. B. G. Northrop's article in the March number of *The Forum*, entitled "The Work of Village-Improvement Societies." Here they will find illustrative instances of what can be done, and of what has been done by the movement inaugurated forty years ago with the incorporation of the Laurel Hill Association of Stockbridge, Massachusetts. The account of what has been achieved by this association is most instructive, and no one will doubt the statement that every acre of land and every homestead in Stockbridge has appreciated in value by reason of this society. There are rapid sketches of many other societies in the western as well as in the eastern states where the great benefit of concerted effort is shown, not merely in the way of accomplishing certain ends which are impracticable by individual effort, but also of exciting public sentiment so that it reacts upon individuals and prompts them, not only to improve their own property, but to bestow valuable gifts upon their fellow-townsmen.

The effectiveness of these societies in securing public libraries and the value of similar associations in cities like Springfield, Massachusetts, and New Haven are also recorded, but, perhaps, the most interesting fact which Mr. Northrop brings out is the dominating part which women may play in these local, and yet public, enterprises. The Laurel Hill Association was originated by a woman, and the members of the Honesdale Improvement Association, which is called the model society of Pennsylvania, are all women, although men are admitted to honorary membership, and a Young People's Auxiliary Association, including school-children, has been enlisted to protect flower-beds and shrubbery and gather waste paper scraps into neatly painted and labeled boxes. That women do not concern themselves exclusively with the ornamental branches of village improvement is shown by the fact that in Honesdale the first things advocated were improved sewerage and sanitation; and a similar spirit has marked the work of the Woman's Town Improvement Association of Montclair, New Jersey. A recent report of the Honesdale Association, as quoted by Mr. Northrop, says: "We did not overestimate the public spirit of our townspeople and their hearty coöperation in our endeavors. This is notably the attitude of our Town Council in every appeal we have made to them." And it is added that the citizens and the local papers, irrespective of political parties, heartily support this active body, composed of influential women of tact and zeal, who, at the birth of the association, were two hundred and fifty in number.

These assertions have a peculiar interest as indicating why, in this, as in many other branches of public service, women may do better work than men. Being less absorbed by business cares, and personally free from public responsibilities of a general sort, they have more time and more zeal to bestow upon local public matters than men, while, as a rule, their tact is finer. But the main point is that, being "out of politics," they are more readily credited than men with unselfishness and a pure concern for the public welfare. The history of the Woman's Club of Chicago and of other similar bodies in other large cities has proved this fact, and it demonstrates that men and newspapers of all shades of opinion will support a movement inaugurated by women, when, had it been inaugurated by men of different political opinions, they would

have felt moved to oppose it. What is true in large cities is as true of small towns; and we believe that if the women of America will generally devote themselves to such useful and fruitful public work as has been accomplished by their sisters in Honesdale and Montclair, they will find that they are not without influence, even though they cannot vote.

Trees of Minor Importance for Western Planting.

THE principal deciduous trees that succeed in the west are Cottonwood, Box Elder, Russian Mulberry, Silver Maple, Catalpa, Black Locust, Honey Locust, White Elm, Green Ash, Black Walnut, Wild Cherry and Burr Oak. Besides these, White and Red Oak and Chestnut grow well in certain localities, principally toward the eastern part of the region south of the Dakotas. In addition to these, several other well-known species can be successfully grown in the Plain region. The Hackberry, or Nettle-tree, has a natural distribution almost as wide as that of the Box Elder, being found throughout Nebraska and South Dakota, and along the streams of northern Kansas. It grows rapidly under cultivation, and succeeds very well on high land. It endures shade well, at least while young, and can be used for mixing with Box Elder and other shade-enduring species.

Ailanthus was recommended almost without qualification in the early days of Kansas tree-planting, but the past few dry seasons have proved that it is worthless on high land, and of little value in any locality. Grown as coppice—that is, to be cut to the ground every few years—it makes a great deal of fuel, but in close plantation it can hardly be grown as a timber-tree. The species is too tender for northern Nebraska and the Dakotas.

A few Kentucky Coffee-trees at Hutchinson, Kansas, are doing well, and as this species is native throughout eastern Kansas, there should be no difficulty in its cultivation, except in high localities. Its large decompound leaves make it an interesting tree for lawn planting.

Very fine specimens of Sycamore were also seen at Hutchinson, but this tree is not successful on high ground and cannot stand northern winters. Strong two-year-old trees were killed to the ground at Brookings, South Dakota, after making a good summer growth.

The Russian Poplars and Willows have been quite extensively planted in South Dakota, but it is doubtful if they are acquisitions of special value. Mr. James Smith planted them extensively at Cresbard, Faulk County, South Dakota, in 1883 and 1884, and for several years they were very promising, but the attacks of the Cottonwood-leaf beetle, *Lina scripta*, followed by the excessive drought of the past few years, have completely destroyed his plantation. *Populus Certinensis* was largely planted at Brookings, where it failed when grown side by side with Cottonwood, a good proportion of which survived. *Salix fragilis*, a Russian Willow, has produced a great mass of branches, and cannot be grown in tree form, though introduced as a forest-tree.

The Laurel-leaved Willow, where protected from the beetle, is a beautiful small-sized tree that can be grown throughout the west.

The Basswood, or Linn, is native along all the streams in the eastern part of the plains, and would, doubtless, be successful under cultivation in places not too dry. There are few farm uses to which the wood can be put, however, so that its principal value in western planting would be to add variety to lawn or grove. Few of our native trees have such large clean leaves, and the sweet fragrance of its flowers, combined with its luxuriant foliage and clean growth, should make it an acceptable lawn-tree. The Hawthorns grow well in eastern Nebraska and Kansas, but these can hardly have a place in artificial planting, as every purpose they could fill would be much better served by the Plums.

The Plum is one of the native trees of the west, and every farmer should plant plum-pits in the margin of his

shelter-belt, not only for the excellent fruit which he is likely to get if he plants selected seed, but because the Plum, being a low bushy grower, brings the branches of his plantation down to the surface of the ground, and is, therefore, effective in keeping out winter winds. The Nebraska Choke Cherry, *Prunus Besseyii*, and even the Sand Cherry, can be grown in the same way, and the Sand Cherry, besides bringing the fine branches close to the soil, affords an abundant supply of food for birds. The tree is hardier than the Russian Mulberry, and it can, therefore, supplant that variety in the north.

Washington, D. C.

Charles A. Keffer.

Foreign Correspondence.

London Letter.

DENDROBİUM JOHNSONAE.—Messrs. F. Sander & Co. advertise this week an auction sale of "nearly a thousand plants, in superb condition," of this large-flowered species, which has been known since 1882, when it was introduced by Messrs. J. Veitch & Sons, for whom it was named *Dendrobium Macfarlanei* by Professor Reichenbach. Four years later (1886) the professor described it as having "flowers quite excellent; they surpass those of *D. Phalaenopsis*, and are as large as those of *D. formosum*." In 1891 Mr. Rolfe, on receiving "a fine raceme of this splendid species for determination from Admiral Fairfax, who collected the plant in New Guinea," renamed it *D. niveum*, as the name *D. Macfarlanei* had been given to another very different plant from that named for Veitch by Reichenbach. But even this second name was not allowed to go unchallenged, Sir F. von Mueller, the well-known Melbourne botanist, pointing out, in *The Gardeners' Chronicle*, in May, 1891, that the correct name for the plant introduced by Veitch was *D. Johnsonae*, and that he had described it in May, 1882, in the *Southern Science Record*, and that it had been discovered in New Guinea by the missionary, the Rev. James Chalmers, whose particular wish it was that his magnificent Orchid should bear the name of a Miss Johnson, of Sydney, who has interested herself in the New Guinea mission.

Reichenbach wrote in 1886 that "this Dendrobie, in its chaste and glowing beauty, may one day be an object of the most ardent interest to those who cultivate Dendrobiums."

According to Messrs. Sander & Co.'s description, this *Dendrobium* is a free grower with pseudo-bulbs and habit resembling those of *D. densiflorum*. As many as thirty spikes have been borne by a single imported plant; there are fifteen or more flowers on each spike, each flower being four to five inches in diameter, snow-white, suggesting a white *Laelia anceps*. The mid-lobe of the lip is variable in color, usually blue, sometimes orange. It is figured in *Reichenbachia*, t. 61, where the flowers are described as "pure white, with the exception of some slight purple stains on the side lobes of the lip." Mr. Rolfe informs me that he has seen flowers which were totally white. Messrs. Sander & Co. say *D. Johnsonae* should be grown with its north Australian congeners (*D. Phalaenopsis*, *D. bigibbum*, etc.), and that when making new pseudo-bulbs a high temperature is necessary. There are from three to eight flowers on the spikes represented in the figure in *Reichenbachia*.

DENDROBİUM SPECIOSISSIMUM.—This is a new species which Messrs. H. Low & Co., Clapton, have introduced, and now advertise for auction sale as a fine *Dendrobium* discovered by Sir Hugh Low on Mount Kina Balu, in Borneo, in 1867. He sent dried specimens of it to Kew in 1867, but they were too imperfect to be named with certainty. He describes it as being similar to *D. formosum*, but the pseudo-bulbs are much hairier, and the flowers, which are of great size and substance, are white, with a blotch of rich purple-red at the base of the labellum. The flowers are borne in clusters of about four on the ends of the short pseudo-bulbs. Sir Hugh Low says he found it growing on a Mag-

nolia. *D. Lowii*, to which this new species is evidently allied, was found in the same country by Sir Hugh Low. In that species, however, the flowers are buff-yellow, with an orange-red blotch on the labellum. All the *Dendrobies* of this section, *Formosae*, are large and handsome in flower, and have hairy pseudo-bulbs.

NEW CATASETUMS.—The two last issued parts of *Lindenia* (January and February, 1895) are devoted to eight pictures of Monsieur Linden's new Catasetums, some of which he exhibited in a collection at a meeting of the Royal Horticultural Society, and which were then voted one of the most interesting and attractive exhibits seen in London in recent years. Monsieur Linden says he has twenty distinct species or varieties or natural hybrids, whichever one prefers to call them. Some only differ from *C. Bunge-rothii*, as figured in the *Botanical Magazine*, in color, but others are quite different in form from that species, and are more like *C. macrocarpum*. Both these last-named species are found growing together in a wild state, and the inference is that they have been naturally hybridized, these beautiful and wonderful plants in the possession of Monsieur Linden being the result. I do not remember anything more remarkable in the whole history of Orchid collecting than the discovery of this collection of Catasetums by Monsieur Linden's collector. The conditions under which they were found have yet to be made known. Nor is there a parallel among the many hybrid Orchids raised artificially, true hybrids, as a rule, showing comparatively little variation. Catasetums have not yet been artificially hybridized; possibly they refused to ripen seeds under cultivation, still the experiment might be made with *C. Bunge-rothii* and *C. macrocarpum*.

The genus had not a prominent position among popular Orchids until *Catasetum Bunge-rothii* was introduced, and even that fine species was not strong enough to lift Catasetums into the front rank. But these new ones, figured by Monsieur Linden, and most of which I have seen in flower, are really grand Orchids. I know no tropical Orchid more worthy of a place in the garden than the Catasetums which Monsieur Linden calls *C. imperiale*, *C. splendens*, var. *atropurpureum*, *C. Lindeni*, *C. mirabile*, and, in fact, all that I have seen of this set. Their origin will be as interesting to botanists as their large, richly colored, singularly formed flowers will be to cultivators.

ELOPHIELLA ELIZABETHÆ.—Two plants of this handsome Orchid are now flowering at Kew. They were obtained in the autumn of 1893, when they were newly imported from Madagascar, and they have been growing ever since in teak baskets suspended over a hot-water tank in a tropical house; they are planted in pure sphagnum moss, and they have been liberally watered always. The strongest has made leaves three feet long by one and a half inches broad, four to each growth, and one bears three, the other two spikes. These are horizontal, a foot to eighteen inches in length, straight, dull brown-purple, with ovate-concave bracts. There are sixteen flowers and buds on the strongest spike and these are like the figure in the *Botanical Magazine*, t. 7387, in size, form and color, except that they are not tinged with rose on the inside of the segments. The growths are not as yet nearly as strong as the imported bulbs show they ought to be, and I am doubtful of our being able to keep this Orchid for any length of time. Plants of it are also in flower in the St. Albans nurseries.

CATLEYA PERCIVALIANA is a beautiful and useful Orchid which deserves to be more largely grown than it is. Several plants of it here are in flower now, the flowers of medium size, elegant in form, and of the richest shades of maroon-purple and mauve. It was introduced in 1882 from south-west Venezuela, where it is said to "invariably grow on rocks, not on trees, and in full exposure to the sun, generally in the vicinity of river courses, which, in the rainy season, afford abundant moisture to the plant." Under cultivation it thrives when planted in peat and sphagnum, either in a basket or on a raft. The preference for rocks is a peculiarity of another handsome winter-flowering Orchid,

namely, *Epidendrum bicornutum*, which forms thick masses on exposed rocks near the sea in the island of Trinidad. It also thrives in peat and sphagnum in baskets, requiring excessive heat and moisture while making new growth.

MAXILLARIA LINDENIÆ.—The March number of *Lindenia* contains a figure and description of this handsome Orchid, which was introduced from Peru in 1893 by *L'Horticulture Internationale*, and flowered in their nursery in the following January. It was first described by Cognieux in the *Journal des Orchidées* last year, p. 362. I lately saw a flower of what is evidently the same plant and which is in the collection of Sir Trevor Lawrence, under another probably erroneous name. It is a near ally of *M. venusta*, but the segments are broader, the figure in *Lindenia* suggesting a flower of *Lycaste Skinneri*. They are white, with longitudinal lines of purple on the sepals and the outside basal portion of the lip, the front lobe inside being yellow, with red marginal blotches. The differences between it and *M. venusta* are pointed out in *Lindenia*, the principal one being the monophyllous pseudo-bulbs and the shorter, broader flower segments in *M. Lindeniae*. It is likely to thrive in the cool Orchid-house.

THOMAS BAINES.—This famous English gardener succumbed this week to an attack of influenza. He was seventy-two years of age, having been born in North Lancashire, at Claughton Hall, where his father was gardener and his grandfather before him. Thirty years ago Mr. Baines was without a rival as a cultivator of specimen pot plants, and his collections were rarely second to any wherever he exhibited them. Hard-wooded greenhouse plants grew to an enormous size and flowered with wonderful prodigality under his treatment. He was equally successful with Palms, Ferns, Pitcher-plants, Crotons and Orchids, the specimens of these shown by him in London, Manchester, all over England, in fact, being marvels of cultural skill, even to men who were skillful cultivators themselves. For the last twenty years Mr. Baines practiced with conspicuous success as a landscape-gardener. He was an ardent disciple of the natural style and used to speak of *Coniferae* as the bane of many English gardens. I have always known him as "Old Tom." He was a prolific writer for the gardening press, and he wrote an excellent book on the cultivation of stove and greenhouse plants.

W. Watson.

London.

Plant Notes.

PITTOSPORUM UNDULATUM.—This plant is an evergreen greenhouse shrub, introduced into British gardens from Australia toward the end of the last century. It is one of the best of the genus, the long, linear, wavy leaves giving a graceful appearance to the otherwise somewhat stiff habits of growth; the leaves are also a rich deep green, shining, and of good substance. It thrives in a cool house in winter, and in summer can be used for decorating the piazza or grounds. The small white flowers open in January and continue into March; they are borne in clusters on the tips of the branches, have a pleasant fragrance and continue in good condition for weeks. This is a good house plant; the combination of flowers and foliage is effective, and it will withstand the usually trying conditions of living-rooms if kept well watered. The cultural requirements are simple; a rich soil, with plenty of peat and sharp sand, is the best potting material, and overpotting should be avoided. The propagation is by seeds, which are abundantly produced on older plants; the seedling grows quickly, making blooming plants in from two to three years. It is well to keep up a fresh supply of young specimens, as the older plants frequently lose much of their symmetry and become too large and overgrown for handling with ease. It thrives out-of-doors in Florida, and is one of the common shrubs of southern California.

PELARGONIUM HENRY COX.—This is the prettiest of the so-called golden tricolor section, and has been valued in green-

houses for some years for its beautiful foliage. None of the *Pelargoniums* are as bright-colored as this little plant, whose vigor is apparently expended chiefly in the production of highly colored leaves, which, when well grown, are more showy than many flowers. They have usually a bright green centre, a zone of brilliant red, with black markings and a broad edging of clear light yellow. White stems are also a distinct attraction of this plant. It needs a rather subdued light in a warm house, but cannot be coaxed into rampant growth. Owing to its slow increase it is not a favorite with dealers, and is seldom offered by plantsmen, so that it is probably not widely cultivated. The flowers are borne infrequently and are of little beauty, being small and of a light magenta color.

GALANTHUS ELWESII.—This fine Snowdrop is now produced in large quantities by European growers, and consequently is offered at such low prices that it is almost as cheap as the common *Galanthus nivalis*. It is sometimes called the Giant Snowdrop, an excellent name, for it is our old friend magnified, and that, too, without added coarseness or any objectionable quality. It is as early to bloom, as hardy, and has the form and peculiarity of blossom and coloring which we associate with the first flower which ushers in our spring. It is a native of Asia Minor, and, although known as early as 1854, was not introduced into gardens by the man whose name it bears until 1875. It can hardly be called common even now, since it is only recently that bulbs have been grown or collected in sufficient quantities to supply the demand. This, like most other Snowdrops, gives the best results after it has been planted several years; it must be well established, growing compactly in clumps, to give an abundance of flowers. It is not necessary to separate them every three or four years, as is the case with so many bulbous plants. One of the best positions for these, or other early spring-flowering bulbs, is along the foundation-wall of the house or greenhouse; they can be planted directly against the brick or stone work, and so obtain not only good protection, but also additional warmth; unlike other plants, they do not suffer here from the summer drought, because their growth comes in late autumn or early spring, when there is plenty of moisture. This Snowdrop makes a good edging, and can be naturalized in grass or on the borders of a shrubbery.

ERANTHIS HYEMALIS.—This plant, commonly known as the Winter Aconite, is one of our earliest flowers. It is in bloom now, with Snowdrops and Crocuses, showing its bright yellow flowers, which are of good size and are supplied with more foliage, in the form of a deeply cut involucrum, than we usually find in plants at this season. It is a native of western Europe, and has been long in cultivation. It belongs to the Buttercup family and has a tuberous root, a corm; it is usually classed and cultivated with the "Dutch bulbs." The tubers should be planted as early in autumn as possible; they are quite small, and not infrequently arrive in poor condition, suffering from too long exposure to the air. It is a good plan to plant them in sand—that is, after preparing the soil and removing a sufficient quantity of earth for the purpose, put half an inch of sand over the surface thus exposed, then plant the bulbs and cover them with an equal amount of sand, after which the soil removed can be replaced and the planting completed. The tubers are thus surrounded with sand and are less likely to be injured by too much moisture. This *Eranthis* should be grown in a warm, sheltered, sunny position; it may also be used in the wild garden, and in grass, provided the latter is not too thick and well kept. In favorable situations it sometimes propagates itself abundantly by seeds.

CLIVIA (IMANTOPHYLLUM) MINIATA.—This is one of the old-fashioned greenhouse plants which is thoroughly good and admirably suited for private places. If kept in a cool house, it is now in good bloom, showing its large highly colored orange-red flowers in full clusters on stout stems, well relieved by the thick mass of dark glossy green foliage. Although introduced forty years ago, this Ama-

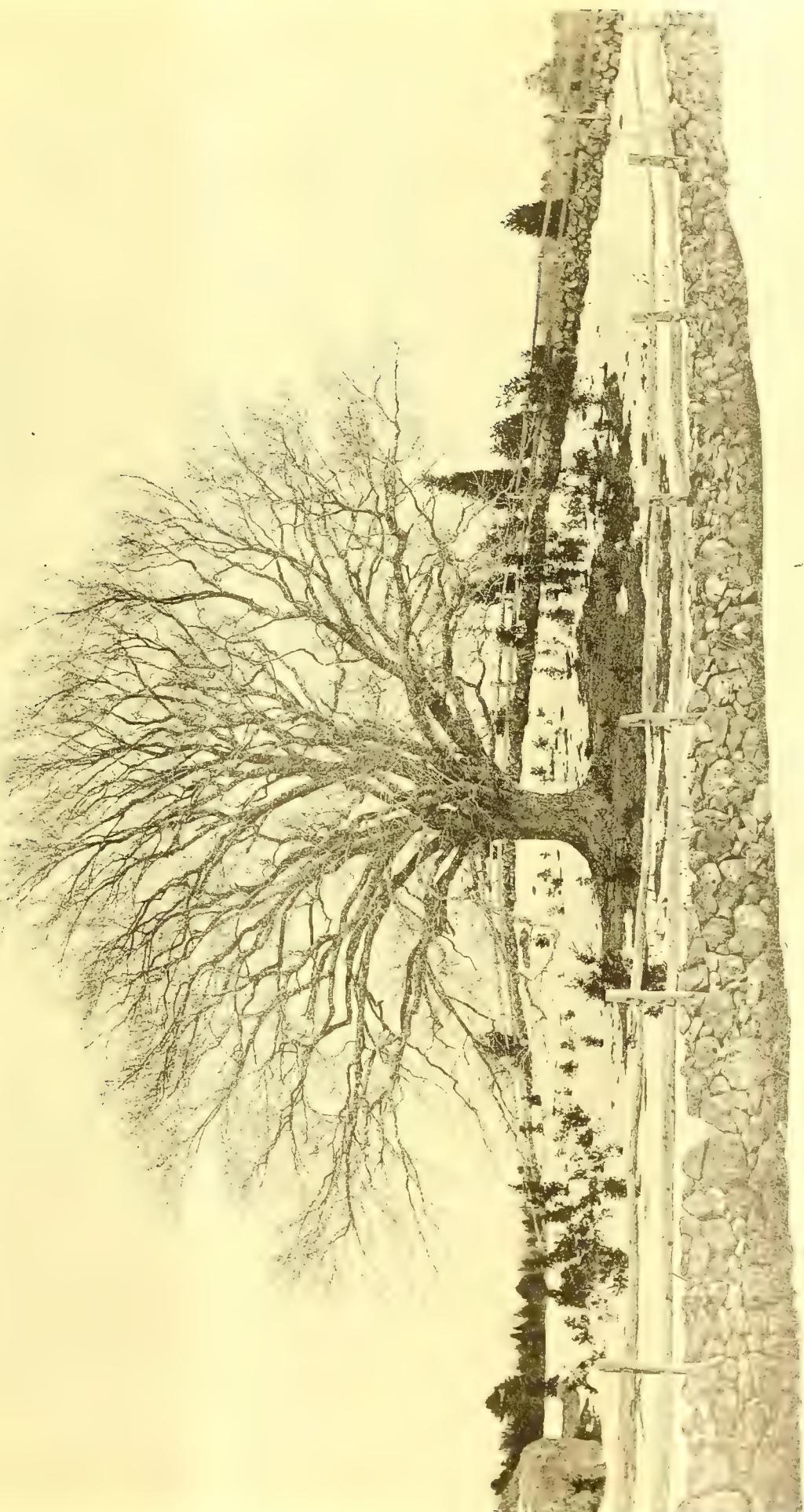


Fig. 19.—Beech Tree in South Hingham, Massachusetts.—See page 124.

rylid is still one of the best of winter-flowering plants. Clivias thrive in a warm rich soil made of rotted sod and peat, and, since they are kept for several years in the same pot or tub after they have attained size, it is well to add coarsely broken bone and charcoal when potting good specimens. The propagation is sometimes by seeds, but more commonly by division, either by removing some of the offsets or by tearing an old plant to pieces. This last is best done just after the plant blooms; the small plants thus obtained should be planted in five or six inch pots in a rather sandy soil; if well done they will often produce flowering plants in one season. Seeds are not easily obtainable; it is said that the production of seeds weakens the old plant, and they are seldom used except for procuring new varieties. In summer good-sized plants are useful for decorating grounds and piazzas. Too much praise can hardly be given to the splendid race of hybrids and seedlings which have been raised from this plant in Belgium and England.

Cultural Department.

Vegetables for Private Gardens.

TWENTY, or even ten years ago, it was a comparatively simple task to select a list of vegetables for home use, but with the annual introduction of the numerous varieties found in the catalogues of seedsmen, the problem has become complicated. It is a popular error that a majority of these novelties are old favorites with new titles. It is only fair to say in defense of the seed dealer that this is not so, for while some novelties are fictitious, most of them are genuine, and they indicate a marked advance on the types of a few years ago. The fact is, that there is a large increase of critical growers who demand improvements to suit their special wants, and the seed dealer who fails to meet this demand is left behind in the race.

I am closely in contact with competent gardeners, both commercial and private, and know that the varieties used by the former class are not of great use to the others, as a rule, and my object in these notes is to point out what qualities are desirable in vegetables raised for the home table. The notes will also show that one who plants for his own table should avoid many sorts used by the market-gardener, whose object is to grow a radish that "bunches well," or a pea that "fills the basket" quickly, or a muskmelon that is "grand for shipping," features absolutely essential for commerce, but often secured only at the sacrifice of the highest table qualities. The best way to accomplish this purpose will be to give a list of vegetables with the qualities most to be desired in each, and to add in each instance the names of such as approach most nearly the ideal standard.

BEET.—Freedom from fibrous or woody texture, constancy of color, a smooth clean root, smallness of foliage, are qualities to be most desired.

Dewings Blood Red, Eclipse, Edmand's Red Turnip, Long Smooth.

BUSH BEANS (wax and green podded).—The best varieties make strong, compact plants, free from runners, bearing shapely pods that are slow to develop stringy or parchment-like character, both elements of toughness. Round podded varieties are generally best and most tender.

Early Red Valentine, Extra Early Refugee, Refugee (or 1,000 to 1), Black Wax, Wardwell's Kidney Wax.

POLE BEANS.—Secure all points, as in Bush Beans, but see that a sort is chosen that "takes poles" freely.

Horticultural Pole, Old Homestead, Golden Cluster Wax, Golden Champion Wax.

The best Pole Lima Bean is certainly Dreer's Improved.

CABBAGE.—Compact habit, small leaf-veins, short strong stem, few outside leaves; if for keeping, solidity of head; if for early use, tenderness and delicate flavor in green state are essentials.

Jersey Wakefield (early), Early Dwarf York, Succession (medium early), Late Flat Dutch.

CAULIFLOWER.—Self-protecting foliage—that is, the habit of the leaves to fold inwardly, which insures a tender white flower; smooth surface of flower; freedom from green leaves growing through the flower. Compact habit of plant and ability to withstand extreme climatic conditions are points to secure.

Extra Early Dwarf Erfurt, Thorburn's Gilt-edge, Henderson's Early Snowball.

CARROT.—Depth and character of soil is essential to success-

ful cultivation of long varieties. If the soil is unfavorable, the roots will be forked and generally irregular. Bright color and absence of core are essential; a small compact top is also an advantage where room is valuable.

French Forcing and Early Scarlet Horn for soups; Early Half-long Carentan, the best of all; Half-long Danvers.

CELERY.—Flavor and freedom from string in leaf-stalks must have first consideration, and sorts deficient in these qualities should be left alone. The red varieties are the best, though generally considered less ornamental. A test of crispness and solidity is to snap the stalks; the more strings shown the tougher it will be.

White Plume, Pink Plume, Golden Dwarf, Perle le Grand, New Rose.

SUGAR CORN.—Sweetness is to be desired first and always. Small cob, deep grain, low-earing habit, ability to resist smut (early red-cob varieties are most subject to this), strong husk, which generally keeps the grain tender a long time, are all desirable qualities.

Perry's Hybrid, Stabler's Early, Hickox, Country Gentleman (the best), Stowell's Evergreen.

CUCUMBER.—Secure strong vine, freedom in setting fruit, medium size, symmetry of shape, firm flesh, few seeds and delicate flavor.

Early White Spine, Cool and Crisp, Livingston's Evergreen.

LETTUCE.—Varieties with large veins in the leaves are to be avoided; compact, close-heading habit is essential; never plant a sort with a heavy stem growing where the heart should be; thin, tender leaves, as distinguished from "flannelly" leaves, should be sought. The foregoing points will always secure good color and tenderness. Ability to resist "running to seed" is a hard point to cover; some seasons will encourage this fault in the best varieties. For sweetness of flavor none can surpass the Cos or Romaine sorts.

Curled Simpson and Black-seeded Simpson are early and loose-headed. Boston Market and Golden Queen are early and solid-headed. Salamander and Henderson's Big Boston are solid-headed summer sorts.

MUSKMELON.—Flavor must be supreme here. A good variety should have thin rind, and the seed cavity should be small. These points will insure depth of flesh, which should also be fine-grained and entirely melting. Color in the flesh is not of importance generally, though the very best varieties happen to be red or salmon fleshed.

Netted Gem (green-fleshed), Jenny Lind (green-fleshed), Emerald Gem (salmon-fleshed), Christiana (salmon-fleshed).

WATERMELON.—Desirable points are the same as in the Muskmelon generally, but a large "heart" is essential, this being the best-flavored part of the fruit.

Cole's Early, Ice Cream (white-seeded), Florida Favorite, Dark Icing.

ONION.—Good-keeping qualities, symmetrical shape, freedom from neck, and mild flavor are the prime requisites.

White Portugal, Yellow Globe Danvers, Southport Red Globe, Southport White Globe, Southport Yellow Globe, Prizetaker.

PUMPKIN.—The two sorts named below are both fine-grained and deep-fleshed. The first is a smaller and more finely bred selection of the latter.

Calhoun, Cheese.

PEAS.—Here, if anywhere, every one knows what he wants. I merely submit a list of sorts arranged in their order of maturing, adding the height in feet attained generally by each sort.

Henderson's First of all (two and a half feet), American Wonder (one foot), Chelsea (one and a quarter feet), Advance (two feet), Everbearing (two and a half feet), Heroine (three feet), Admiral (four feet), Champion of England (five feet), Telephone (six feet).

RADISH.—A small top and fine tap-root; the top should occupy but a small portion of the surface of the bulb; the latter should be clear in color and free from rootlets; the flesh should be crisp and mild in flavor; above all, it must grow quickly, otherwise it will be pithy. I have purposely included only the small delicately flavored sorts.

Red Forcing, Scarlet Turnip, French Breakfast, Long Brightest Scarlet.

SQUASH.—For early summer use grow either White Bush, scalloped, or Bush Summer, crook neck. The latter is the drier-fleshed sort. For keeping, select sorts with hard, but thin, shell, small seed cavity (insuring deep flesh) and fine-grained flesh of rich dry flavor.

Early Prolific Marrow, Boston Marrow, Essex Hybrid (the best-flavored).

TOMATO.—Do not grow the biggest varieties. Secure a strong, but not rank, grower with medium-sized fruits that are

produced freely. The flesh must be solid, the core perfectly tender, seeds few, and there must be no seed cavity or tough skin. The shape should be round, without depression at the stem or blossom-end, and there should be no corrugation.

Ignotum (the best of all), Dwarf Champion, Favorite, Beauty, Trophy, Perfection.

TURNIP.—Small top and root, good-shaped bulb, rapidity of growth, tender flesh and mild flavor.

Early Snowball, Red-top Strap-leaf, Purple-top White Globe, Golden Ball or Orange Jelly.

Bloomfield, N. J.

S. A.

Flower Garden Notes.

ALTERATIONS are needed in the garden that have suggested themselves during the past season, and if, as often happens, there was not time to make these in the early fall, they should be started as soon as the soil is in workable condition. The roots of plants and trees seem to begin their work before the frost is really out of the ground, and certainly the earlier plants are moved the more likely are they to make a good display.

Paeonies should be moved very early, especially if the roots are to be divided. They are generally considered difficult to transplant, but this is not true if they are moved early enough and all the tubers taken up without damage, a sharp knife being used to sever the parts near the buds, so that they may not be injured. If these details are seen to, the plants will flower as well during the succeeding summer as though they had not been disturbed. The Tree Paeonies are not seen in gardens as often as they deserve. They are perfectly hardy with us; they flower as freely as the herbaceous kinds, and much earlier in the season before the arrival of the rose-bugs; this is a great advantage, for it is difficult to think of the later kinds without associating them with this troublesome pest. The old *Paeonia officinalis* is also early-flowering, and belongs to a different section, being, indeed, a true species, with several varieties. The old original scarlet is a fine showy plant in the border, coming in soon after *P. tenuifolia*. *P. corallina* is a single-flowered early species with coral-red flowers. This plant is rare in gardens, and is a native of Asia Minor. Another good garden-plant is *P. Wittmanniana*, from the Caucasus, with very distinct foliage, and single creamy white flowers early in the season. *P. corallina* and *P. Wittmanniana* are proving quite hardy here, and add much to the interest of the garden early in the season, between the flowering of spring bulbs and the majority of true herbaceous plants. Single-flowered Paeonies are not often seen, partly on account of their rarity in trade-lists, but their beauty is undisputed. *P. albiflora* is more common, but is grown by few cultivators, though it is a fine companion for the above-named sorts, and is the parent of the race of our numerous garden varieties. It is not commonly known that in California, and I think also in Oregon, a Paeony is found growing wild. This Paeony, *P. Brownii*, is not a showy plant, and for this reason is but little known, but it is a true Paeony, indigenous to the United States.

It is now proven that the Eremuri can be grown here as easily as in Europe, and they are among the most noble of hardy plants. We have three specimens established here, but have thus far flowered only *Eremurus robustus*; the others will probably flower during the coming season. The long, thick, fleshy roots of the Eremuruses are peculiar in their construction; they radiate from a central crown-bud and spread in all directions, making it difficult to pack them safely. Our roots came from Holland in good condition, and *E. robustus* flowered the first summer after planting, as noted in GARDEN AND FOREST last year. The other two kinds are *E. Himalayicus* and *E. Olgæ*. We planted them in a situation that insured dryness in the fall, so that the crowns should ripen after flowering. A thin covering of manure was spread over the soil in fall as a mulch rather than as a protection. Eremurus-seeds seem to be somewhat erratic in their germination. We sowed all that matured as soon as they were ripe, and only two plants have come up, while Mr. Endicott stated in GARDEN AND FOREST some time since that seeds he sowed came up thickly under the same treatment. Eremuri should be planted in the fall, as the foliage dies down soon after the plants flower in summer, and reappears very early in spring; it would, therefore, be unwise to disturb the roots in the spring unless this cannot be avoided.

The stock of hardy Pyrethrums is easily increased at this time, or as soon as the young shoots appear above ground. These may be taken off as low down as possible and the cuttings put in sand. They will root quickly and flower during the coming summer as well as if they were left on the old roots. Old clumps may also be divided, and then there are

always some shoots that may be spared for use as cuttings. For the best double kinds it is desirable to have a few reserve plants, since the old clumps sometimes die out if left too long in one place and the soil becomes exhausted. Propagation cannot be done too soon after the shoots show above ground in spring. Old plants of the Oriental Poppies must also be moved at the first peeping of the shoots, as these are early-flowering and strong-growing plants. They need rich soil and fall planting, if this is possible. To propagate more Poppies, as soon as the roots can be lifted they should be cut in pieces an inch or two long and these should be placed in sand in a warm house when they will sprout in a week or two. They will make fine stock to flower next year if these young plants are set out in May in good soil. Root-cuttings are the only reliable means to reproduce any special variety, as from seed scarcely any two will be alike.

South Lancaster, Mass.

E. O. Orpet.

Hints on Potting Orchids.

FOR potting material many good growers now use peat alone, while others believe in a mixture of peat and sphagnum, which has the advantage of retaining the moisture better. As the sphagnum gets worn out sooner than peat, more frequent shifting is needed, but, where this can conveniently be done, the mixture is, no doubt, better than peat alone. In either case the material should be broken up and well washed to remove all eggs of snails and insects, then left to dry again before using. Baskets are preferable to pots for most of the more commonly grown species, such as Cattleyas, Dendrobiums, Lælias, and, in short, all that require a plentiful supply of air at the roots. For others, such as Cypripediums and Odontoglossums, which require the roots kept rather cool, pots or pans are the more suitable. In shifting, shake the plants well out, and if they have suffered in any way from stagnation the roots will need to be well washed, all decayed root and parts should be cut away, and particular attention should be paid to removing all dead matter from around the eyes, so as to have them perfectly clear. Thorough drainage should always be given, and the addition of a few pieces of charcoal above the crocks is very advantageous. In placing the plants in the baskets or pots, see that they are set so that the roots from the young growth to be made this year will have plenty of room to enter the compost. If the plants are placed in the centre without regard paid to this point when the young growths have pushed their roots, they will not be found in the basket or pot, but to be over the side of it.

Where the plants have few or no roots it is a good plan to tie a little peat or sphagnum around the base with a strip of raffia; this keeps them in shape and protects them when being placed in position, and since firm potting is essential it makes sure that the material is packed closely around them.

Tarrytown, N. Y.

William Scott.

Chrysanthemums.

THE arrival of new Chrysanthemums marks the beginning of the busy season for the cultivator of these flowers. The old varieties on hand, intended for specimen plants, will be considerably in advance of these new sorts. Although we try all new introductions which show any promise as specimen plants, we do not rely on them, but rather on tested kinds. Exhibitors, however, all things being equal, usually get most credit for well-grown plants of striking novelties, especially in the matter of color. Portia won a good deal of credit last season as an exquisite pink of two shades. Iora, also, had many admirers; the delicate mauve flowers are composed of curled petals, beautifully arranged. Clinton Chafant was another novelty of exceptional value. Unfortunately, very little can be gleaned from the catalogues concerning the value of novelties as bush specimens. They are seldom tested as such, and, if at all, in a very unsatisfactory way. One dealer wrote me that varieties as specimen plants were profitless to handle, so generally has the rating been confined to the blooms as the final test.

The tips should be taken from newly arrived plants, and, as stated in a previous note, these often make the best plants, and certainly the best specimen flowers. The plants should be placed in the garden in May and treated in every way as pot-grown plants are treated, giving them the benefit of careful stopping, tying and watering during dry weather. If they develop the foundation for good specimens by the middle of August we lift them. We consider August the best time for this work, and have never had the loss of foliage so much complained of when the plants are lifted later.

We make only three stages in the potting of our plants.

Growers differ, and, no doubt, it would be safer for the inexperienced to make four. Knowing the character of most of the varieties we grow, helps us to decide on this plan. We shift them from two to four inch pots, and from six to twelve inch pots. The nine or ten inch stage might be added, and for many growers this will be the most convenient limit. Specimens from four to five feet in diameter may be grown in a ten-inch pot. Again, it might not be advisable to shift a poor plant into a twelve-inch pot, and judgment must be used. We are not afraid to make this shift in any case. We use a rather light loam, not very rich, relying on the judicious use of stimulants later on. We do not use any sand, although this is needed in heavy soils, but we add some leaf-soil. We pack loosely, and find this provision against overwatering a safe one, and overwatering is a common misfortune in the cultivation of Chrysanthemums in the earlier stages. If care in watering can be counted upon it is as well to use twelve-inch pots, but not otherwise. At no season is it more important to attend carefully to the stopping of plants, for now, perhaps, more than later, foundation is made for future development. A poorly shaped plant now is not likely to make a good specimen later on. The tips should be taken when an inch or two long, and the softer the better.

Stock plants for cuttings intended for specimen blooms, stored in cold frames, will be moving now, and if they have made five or six inches of growth, as is likely if they have been unusually protected, it is better to cut them over. Nothing will be lost thereby, as there will probably be an abundant crop of cuttings by the first of May. Those stored in the cool greenhouse have already been cut over and are now breaking from the bases. These we shall top-dress in a few days and place in cold frames. In the mean time we shall take every leaf-eye and shoot we can get of reputable novelties.

Wellesley, Mass.

T. D. Hatfield.

Correspondence.

Bordeaux Mixture and Color Tests.

To the Editor of GARDEN AND FOREST:

Sir,—The use of color tests to determine the presence of copper in solution offers a very convenient method for preparing the Bordeaux mixture. The necessity of weighing and straining the lime required by the formula each time the mixture is prepared is thus obviated. This method simplifies the preparation of the mixture so much that those who have learned to use it will not like to give it up unless it can be shown that it is unreliable, or unless something better is brought forward to take its place. So far as our present knowledge goes, no more convenient method than the color test has yet been suggested, neither have the color tests been shown to be unreliable when rightly used.

The work of fighting fungous diseases of cultivated crops for the season of 1895 will soon be upon us, and as some articles published in the columns of GARDEN AND FOREST and elsewhere within the last few months have tended to cast doubts on the advisability of employing one of these color tests, the potassium ferrocyanide, it may be well to consider briefly some of the objections to its use.

In an article on pages 456 and 457 of the last volume of GARDEN AND FOREST Professor Lodeman calls attention to the unusual russetting of apples and pears noticed in many western New York orchards in 1894, and especially to "the important point that Bordeaux mixture, however prepared, increased the evil," and expressed the opinion that the most severe cases were found in orchards sprayed with Bordeaux mixture made by following the potassium ferrocyanide test.

On page 497 of GARDEN AND FOREST, 1894, Professor Jones states that after thorough trials he has no hesitation in sanctioning the use of the ferrocyanide test in preparing Bordeaux mixture for spraying Potatoes, yet in his work in 1894 a russeted appearance of apples and pears followed the use of Bordeaux mixture made by this test for spraying orchards.

Trees at the Geneva Station sprayed with London purple or Paris green with the addition of lime only, so that the arsenites might not spot the foliage, also showed a russeted appearance of the fruit and spotting of the foliage. Trees sprayed with Bordeaux mixture to which no arsenites had been added showed russeted fruit as a result of the spray, as also did trees sprayed with Bordeaux mixture combined with London purple or Paris green. In all three instances corresponding unsprayed trees were practically free from this peculiar russeted fruit. The only substances used in all three instances were the lime and water, in one case combined with an arsenite, in one case with copper sulphate, and in one case with both copper sul-

phate and an arsenite. The Bordeaux mixture was prepared by means of the ferrocyanide test. Taking into consideration only the evidence given here, one might conclude that it was the lime and water in the spraying mixtures that caused the injury rather than the use of the ferrocyanide test.

Bordeaux mixture made according to the ferrocyanide test was used at the Geneva Station in 1893, prepared according to the same formula that was used in 1894. No injurious effects were seen either on foliage or fruit sprayed with this preparation in 1893, even when six treatments were used, but the same preparation sprayed but once in 1894 showed some injury both to foliage and fruit. The prominent new condition which attended the work in 1894 was the unusual cool, cloudy and wet weather during a considerable portion of the spraying season. At Geneva during the week from May 17th to May 23d, 1894, there was less than three per cent. of the possible amount of sunshine, and during the two following weeks but fourteen per cent. and thirty-nine plus per cent. respectively, showing an exceptionally long period of cloudy weather for this locality. The records also show that during this period the temperature was low. From May 16th to June 5th, a period of twenty-one days, rain fell every day, and the total rainfall for these three weeks was seven and thirty-eight hundredths inches. Trees at this period, having just finished blooming, were in a state of active growth both of fruit and foliage. Under such circumstances the unusually long period of dark, cool, rainy weather undoubtedly produced a tender condition of both foliage and fruits, rendering them peculiarly liable to injury upon slight irritation. Such irritation was produced by spraying compounds made without the ferrocyanide test as well as with it, as has already been shown. In fact, as stated by Professor Lodeman in the article cited, and as noticed by others, an unusual russetting of the fruit was found in some instances where trees had not been sprayed at all. Similar weather conditions, Professor Jones informs me, were met with in connection with his work in Vermont.

A series of careful tests in a rainy season, for the purpose of comparing Bordeaux mixture prepared according to the ferrocyanide test, with Bordeaux mixture prepared according to the old and tedious method of weighing the lime, would certainly be a very interesting line of work. We know that the ferrocyanide test has proved reliable in orchard work in an ordinary season, and as yet we have not met with sufficient evidence to prove that it is unreliable in a rainy season such as visited western New York in 1894.

By means of the ferrocyanide test, one part of copper can be detected in 400,000 parts of solution, certainly a delicate test. It is our practice, after this test shows that there is no more copper in solution, to add still more lime so as to insure an excess of that ingredient.

One gentleman reported to the writer that he had injured his Pear crop by spraying with the Bordeaux mixture made by following the ferrocyanide test. Inquiry developed the fact that he stopped adding the lime while the test still showed slight discoloration when dropped into the mixture. Unless, in the instances referred to in Professor Lodeman's article, the mixture was prepared by competent hands, it is possible that, as in the case just cited, the test was not properly used. It is admitted that when Bordeaux mixture is not properly prepared it is liable to produce injury, whether the weather be fair or foul. This may happen when the lime is weighed, as well as when a color test is followed.* If the work must be intrusted to men who cannot be relied on to follow the color test properly, it may be better to have them use the scales, slake each portion of lime by itself and patiently work it all through a gunny sack or some other strainer, according to the old-time custom, rather than depend on a color test for determining the proper amount of lime.

Geneva, N. Y.

S. A. Beach.

Forest Fires in Minnesota.

To the Editor of GARDEN AND FOREST:

Sir,—The best way to stop forest fires is to prevent them from starting. This cannot be done by enacting laws merely. The best of laws will utterly fail, unless the people see to it that they are carried out. Every person in the woods must have it impressed on his mind that no fire must be allowed to get beyond his control. This may seem a great undertaking, but when we consider that there are 20,000 to 25,000 men employed by lumbermen in the Minnesota woods, that the merchants are all studying how to perpetuate the lumber industry, and that they can get information concerning any one through the

* Note the experience of Professor Galloway, Bulletin 3, Division of Vegetable Pathology, U. S. Department of Agriculture, 1892, pp. 39 and 40.

retail stores, that all good citizens are beginning to feel the necessity of keeping every acre of forest productive of timber until it is needed for agriculture, it seems possible that now, after last season's disasters, every citizen could be brought to take an active part in this conference. I believe the time has come to start a movement that will soon establish a public sentiment that will make our forests as safe as the forests of Prussia, where only six one-hundredths of one per cent. of the forest area was burned during the very dry year of 1892. If this can be done in Prussia, why not in America?

Carleton, Minn.

H. B. A.

Recent Publications.

Sweet-scented Flowers and Fragrant Leaves. By Donald McDonald. With sixteen colored plates. Charles Scribner's Sons, New York.

This work is essentially an alphabetical list of plants which are attractive on account of their fragrance. It is true, as the author states, that the professional introducers of new plants pay more attention to the size and shape and color of the flower than they do to its scent, and, therefore, it is a worthy undertaking to make this list to aid those who care particularly for the odorous qualities of plants in selecting fragrant species and varieties. The list will, therefore, prove a useful one, although many of the plants here catalogued have such a faint odor that one would hardly detect it, and, of course, it is impossible within reasonable limits to name all the plants which are pleasing to the sense of smell. We have been particularly interested in observing the efforts of the author to select words to describe the quality of a given odor. This is not an easy task—a more difficult one, indeed, than to describe a color. The only satisfactory way to do this is to say that a given odor resembles some other odor which is well known; but even this will give only an approximate idea of what is meant, since no two flowers have an identical fragrance. Turning over a few pages at random, we observe that the perfumes of different flowers are characterized as delightful, powerful, dainty, delicious, sweet, agreeable, strong, elegant, exquisite and rich. None of these adjectives, with the possible exception of "sweet," gives an accurate idea of the quality of the perfume named. Other odors are described as slight, penetrative or pungent, and these words have reference to the comparative power of odors rather than their quality. Aromatic and balsamic are words more closely descriptive. Other odors are said to be honey-like, musk-scented, lily-scented, lemon-like, or to resemble that of camphor, turpentine, mint, and these adjuncts carry some well-defined ideas. The mingling of two different colors often gives a third which resembles neither one, and some flowers are here said to have two odors, which, however, do not unite to form a third, but can be separately recognized. The flowers of *Clematis Davidiana* are said to have "a delicious fragrance of lemon and spice," a combination which we have never detected. So the fruit-buds of *Calysaccion longifolium* are said to possess an "odor like violets and rose-water," while *Asperula odorata* smells like "cowslips and new-mown hay," and *Cuscuta verucosa* smells like "violets and cowslips mixed." One can hardly understand what these combinations would be like, but still they convey some approximate idea which has more definiteness of meaning than is found in the description of the flowers of *Brugmansia suaveolens*, of which it is said that "their delicious fragrance diffuses through the surrounding atmosphere a perfume of unequalled sweetness."

The list fills one hundred and thirty-six pages, and while it makes no pretense of giving the botanical characters of the plants, the descriptions as a rule make mention of those qualities which would most interest the general reader. We ought to add, that besides the fragrance of the flower, notice is made of plants whose leaves or bark or fruits have a pleasing odor. The list is preceded by a brief treatise on the perfumes of flowers, and a few pages by way of sentimental introduction by Mr. William Robinson, editor of *The Garden*.

A Key to the Trees and Shrubs of New England. By E. Knobel. Bradlee Whidden, Boston. This booklet, which is one of a series intended to facilitate the study of natural history in New England, contains cuts of the leaves of two hundred and fifteen different trees and shrubs and climbers, and they are arranged in such a way that the identity of all the ordinary woody plants which grow in New England can be traced by the form and position of their leaves. The plan is novel, and, of course, like all keys, it is open to some objection. At the same time it will be found very helpful to beginners, who can, with a little study, locate all the native species which come under their observation. *The Ferns and Evergreens of New England* is another little hand-book in the same style, and by the same author, which contains thirty-eight figures of Ferns, besides Lycopodiums. If anything, this little key to the Filices is superior in method to the key to trees and shrubs, and it is especially good in giving, besides illustrations of the frond itself, outlines of the different divisions of the fronds as well as of their fructification. These little books are oblong duodecimos, and cost only fifty cents each; it is to be hoped that the succeeding volumes of the series, which will include notes on the butterflies, beetles, moths, fresh-water fish, frogs, turtles, etc., of New England, will be equally well done.

Notes.

Anemone blanda, *Taurian Scillas*, *Chionodoxas*, *Grape Hyacinths*, *Iris Bakeriana*, *I. histrioides*, with *Crocuses* and *Snowdrops* in variety, are now in bloom in the gardens about this city. Early Daffodils are showing buds.

The American Dahlia Society was permanently organized last Wednesday at Philadelphia, with Robert Kift as President; L. R. Peacock, Secretary; Frank C. Bruton, Treasurer, and A. Blanc, chairman of Executive Committee.

The exceptionally trying winter in Europe has done great injury to Cabbage, Kohl-rabi and Borecole planted for seed. The choice-named varieties of Celery, which are largely grown for seed in northern Europe, are also said to have been seriously injured.

Notwithstanding the fact that fresh fruits come across the continent from California by the train-load at nearly all seasons of the year, dried and canned fruits are annually exported from the same state in still greater quantities. Last year dried and canned fruits equivalent to 30,000 car-loads, or 140,000,000 pounds, were distributed throughout the world from this state.

It is objected to planting Butternuts, Hickories and Chestnuts as roadside trees, that they will be destroyed by boys in gathering the nuts. We agree with Dr. Hoskins, however, that if properly instructed the boys can be made to feel a pride in protecting what they might otherwise destroy. Why not make it a part of Arbor Day exercises to enlist the boys as defenders of the street trees in each school district?

A correspondent of *The Garden*, London, writes that at Esher Place, the residence of Sir Edgar Vincent, there is an old Tulip-tree whose stem girths eighteen feet and seven inches three feet from the ground, while its long lithe branches sweep the greensward in a circle seventy-eight feet across. The tree is in rude health, and shows no dead or dying limbs; the foliage is bright and fresh, and the flowers are produced every year "in almost extravagant abundance."

In the February issue of the *Tōkyō Botanical Magazine*, Mr. Homi Shirasaua describes, under the name of *Tsuga* (*Pseudotsuga*) *Japonica*, a tree recently discovered by him in the Province of Kii, near Yoshino. If this tree, which appears from the figure to be a true *Pseudotsuga* with shorter and broader leaves and a shorter cone than the American species, proves to be really a member of this genus, its presence in Japan is exceedingly interesting, as *Pseudotsuga*, as previously known, is confined to western North America.

A paper of considerable importance, read before the Washington Entomological Society by Professor Hopkins, of the West Virginia Experiment Station, has just been published. It seems to have been established that the potato scab and potato rot are due to bacteria and fungi, but Professor Hopkins shows that certain fungus-gnats belonging to the genera *Sciara* and *Epidapus* are able to inflict injuries upon potatoes which re-

semble the scab and rot, and since the conditions for developing the fungi are the very ones which are most agreeable to the insects, it is highly probable that much of the damage to the potato-crop is in reality due to them.

The Florida correspondent of *The Country Gentleman*, in speaking of the effects of the cold wave of February 7th on the Orange groves of Florida, says that, according to a conservative estimate, all trees under ten years old, except those in unusually favored situations, are dead to the ground or within a foot or so of it. These will have to be cut off and new trees grown from one or two of the sprouts that will spring from the live stumps. The Orange, under favorable conditions, is a vigorous grower and healthy roots will push out a sprout which, in a single summer, will form a shapely head and put out fruit-buds the second spring. In older groves the limbs up to one and a half inches in diameter are probably dead, but as the bark on the trunk and larger limbs is probably sound, these groves will be returning good returns within a decade. Of course, no one yet has any absolute knowledge of the amount of damage to the trees.

The project of making an interstate park which shall contain The Dalles of the St. Croix is advocated both in Minnesota and Wisconsin, the two states which own the land. It is proposed that 250 acres in Wisconsin and 110 acres in Minnesota shall be taken, and the property can be acquired now for a comparatively small sum. The falls are not large, but the rocky ledges which rise in an almost perpendicular wall on either side of the stream, in some places to a height two hundred and fifty feet, make a bit of highly picturesque scenery, and the gray rocks here and there stained with brilliant colors from the oxides of copper which they contain, or painted with lichens and moss, have a rare beauty of their own. The Dalles proper are about a mile in length, the river in its passage through them averaging from fifty to three hundred feet in width, with a depth of one hundred feet. It is said that a clear title can now be obtained for all the land, and it seems to be a wise plan to devote it to public use forever before its rustic beauty shall have been entirely destroyed.

In a review of the White Pine industry in the north-west since 1873 the *North-western Lumberman*, after setting forth what these great Pine forests have done in making possible the settling of southern Minnesota, Iowa and the Missouri valley, shows that from 1873, when the panic occurred which caused extreme stagnation of business, the annual pine product of that region had not reached four billion feet, and owing to the hard times that amount of production was not reached until 1879, when specie payments were resumed. Steadily increasing, the production reached nearly eight billions of feet in 1884, when it fell off a trifle, and then began to increase until 1892, when it reached the enormous total of about nine billion feet. During the last two years there has been a great decline in the output of pine, especially in lower Michigan. The production in northern Wisconsin and Minnesota is likely to continue for some years, however, and then when the decline shall become marked in that part of the field we may expect a rapid subsidence of the northern White Pine industry.

Specimens of discolored leaves of the La France Rose, grown in Philadelphia, were lately sent to Professor Galloway, of the Agricultural Department of Washington, for examination, with the request that he would determine, if possible, the cause. Replying in the *Florists' Exchange*, he suggests that since there was no fungus found, the injury may be due to the action of some poisonous vapors. This was improbable, however, since a poison vapor would naturally affect both sides of the leaf, while the disfiguration in this case was confined entirely to the upper surface of the leaves. It was, therefore, suggested that there might have been some injurious substance in the water with which the leaves were sprinkled. Professor Galloway quotes an interesting article from some German periodical, in which it seems to be demonstrated that Rose-leaves in an outdoor garden were injured by vapor from asphalt which was washed out of the air by falling rain and dropped upon the foliage. Careful study seemed to prove that the slight quantity of iron held in the vapor in the form of iron salts caused the trouble. Of course, the quantity must have been exceedingly minute in this case, and, therefore, it may be possible for an almost infinitesimal percentage of iron in water used upon plants to bring about this discoloration, which is caused by the precipitation of the tannin held in the sap of the leaves. Begonias and other plants which contain no tannin, when subject to the same conditions, received no injury.

The season for Cuba pineapples, which opens here about the middle of April, is already anticipated by advance lots of this fruit in shipments of 100 to 300 barrels. As many as 27,000 barrels arrived in a single week during last May. The variety now beginning to come is the Red, or Strawberry pineapple, and this will be in season here until the last of June. It is most abundant and in best condition in May, when it is in greatest demand for preserving and for making extracts, its rich flavor rendering it specially suitable for this use. The Sugar-loaf pineapple, which comes early in June, continues through July. Good pineapples now cost twenty-five to thirty-five cents each at retail. Florida oranges seem to hold a place entirely their own, for even the shortage of 2,000,000 boxes of this fruit has not made any extraordinary demand for other oranges, or materially increased their prices. Seedling oranges from California sell as low as \$1.50 a box at wholesale, and from this the merchant must deduct ninety cents for freight charges. Navel oranges sell at \$2.75 to \$3.25 by the box. Sicily oranges have been selling at serious loss to importers, and fruit which cost \$1.87 a box in Sicily, with expenses for cartage, insurance, commission, etc., to be added, is sold here at auction for \$1.25 to \$1.75, which means a loss of fifty to seventy-five cents a box. Nearly 44,000 crates of cranberries had been received in this market at this time last year, and about as many crates have been handled here this year, but only 25,000 barrels, as against 51,000 barrels a year ago. The price this season reached \$14.00 a barrel at wholesale, fully double that of ordinary seasons.

Another of the Nestors of American botany has gone. This time it is Isaac Sprague, for nearly half a century the most skillful and prolific botanical draughtsman in America, who died at his home in Wellesley Hills, Massachusetts, on the 15th instant. Isaac Sprague, the son of Isaac Sprague and his wife, Mary Burr, was born in Hingham, on September 5th, 1811. His father, a cooper by trade, was an intellectual man; his mother was known for her remarkable judgment and common sense. The younger Isaac Sprague served his apprenticeship as a carriage-painter with an uncle, spending his holidays and spare hours learning to draw and paint. In 1834, having come into possession of a copy of Nuttall's *Ornithology*, he began to study birds, all his leisure moments during the next ten years being devoted to making himself acquainted with their habits and structure, and in drawing birds and plants. In 1840 Audubon came to visit a friend at Hingham and was much impressed with Sprague's bird pictures, and three years later, at Audubon's request, he passed a month with him in New York, which led to his being invited to join the great naturalist in an expedition to the upper Missouri to assist in making drawings and sketches. A lark discovered during this expedition was named by Audubon Alauda Spraguei. In 1844, at the request of Professor Asa Gray, Sprague visited him in Cambridge; beginning about this time his botanical work, with drawings, for Gray's *Text-book of Botany*, and a series of large botanical charts used by Professor Gray to illustrate a course of lectures in the Lowell Institute.

In 1845 Sprague established himself in Cambridge and devoted his time to scientific work. At this time he made the very successful outline drawings for Mr. Emerson's *Trees and Shrubs of Massachusetts*, a work which, in a second edition, he illustrated at the end of his active career with beautiful colored drawings. In 1848 the first volume of Professor Gray's *Genera Flora Americae Boreali-Orientalis*, a work intended to illustrate the genera of North American plants, appeared. Unfortunately, lack of support brought the undertaking to a close at the end of the second volume; the plates, two hundred in number, were drawn in outline by Mr. Sprague with elaborate analytical details and were far superior to any botanical drawings that had been made in America at that time. They must be considered Sprague's most important work and are still models of their kind. His pencil illustrated Torrey's *Plantæ Fremontianæ*, and all of Dr. Gray's classical memoirs on the plants collected by Charles Wright and others on the southwestern borders of the United States, and his report on the plants collected in the Wilkes Expedition. His published plates give, however, but a slight idea of Sprague's industry, and he has left portfolios filled with drawings of birds, insects and plants, and innumerable sketches.

Spraguea, a beautiful little herb of the foothills of the Sierra Nevada, was dedicated to him by Torrey in token of the appreciation the masters of botanical science in America held for this modest, retiring and industrious man, a true naturalist and lover of nature, to whose skillful pencil much of the value of their work was due.

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TABLE OF CONTENTS.

EDITORIAL ARTICLES:—Why We Need Skilled Foresters	PAGE.
The Farm Home Reading Circle.....	131
The White Pine in the West.....	Professor Charles A. Keffer. 132
Marketing Apples.....	George A. Cochrane. 132
FOREIGN CORRESPONDENCE:—London Letter.....	W. Watson. 133
NEW OR LITTLE-KNOWN PLANTS:—Mimulus Clevelandi. (With figure.)	T. S. Brandegee. 134
PLANT NOTES.....	134
CULTURAL DEPARTMENT:—Some Flowering Plants for Easter.....	W. N. Craig. 136
Japanese Anemones.....	T. D. H. 136
Snowdrops, New and Old.....	J. N. Gerard. 137
The Cherry Fruit Mold.....	Professor Byron D. Halsted. 137
Yellow-fruited Tomatoes.....	F. A. Waugh. 138
Onosma stellulatum.....	J. O. Orpet. 138
Lettuce for Forcing.....	William Scott. 138
CORRESPONDENCE:—Oranges in Southern Mississippi.....	G. T. Drennan. 138
A Large Grapevine.....	J. H. Mellichamp, M.D. 139
EXHIBITIONS:—Spring Flower Show in Boston	S. 139
NOTES	149
ILLUSTRATION:—Mimulus Clevelandi, n. sp., Fig. 20	135

Why We Need Skilled Foresters.

A FORTNIGHT before the adjournment of the last Congress, Mr. Fernow, Chief of the Division of Forestry in Washington, appeared before the House Committee on Agriculture and presented a statement in regard to some proposed legislation for the establishment of courses of forestry in agricultural colleges and the establishment of a national school of forestry. In regard to the special provisions of the two bills under discussion we shall take occasion to speak at another time, but just now it is our purpose to reproduce in a condensed form some of the arguments presented by Mr. Fernow to show why we ought to begin at once to provide for a supply of technically educated forest-managers. The shameful annual waste of our forest resources is due to a lack of knowledge of even the elementary principles of successful forest management, and the waste will continue until the necessity for greater knowledge is realized. This broader knowledge will surely arouse us to attempt the management of our public and private forest-lands on rational principles, and then the demand for skilled foresters will be urgent.

The forest area of the United States is the country's largest producer of value, except its agricultural lands, and these yield their return with much hard human labor, while our forests give their enormous quantity of material, exceeding in value a thousand million dollars every year, for the mere harvesting. Our forests, while yielding twice as much as all our mines of every kind, have been worked as if they were mines, and they have even been mined irrationally. Not only has the accumulation of centuries been taken away with no thought of future production, but the paying ore has been taken out and the tailings have been dumped on the remainder to make its development more difficult—that is, not only have the forests been slaughtered without any attempt to provide for growth in years to come, but the useful species have been culled out and the grounds have been left to inferior kinds to grow up and prevent the natural reproduction of the better kinds, and in this way the value of large areas of growing timber has been impaired.

According to Mr. Fernow's estimate, we have reduced our supplies to a point where we are cutting into our capital at the rate of fifty to seventy-five per cent. of our con-

sumption every year—that is, it is probable that the annual growth of the timber in the United States does not amount to more than a quarter of the wood we cut and use in any year. Of course, a change from these irrational methods ought to have been made long ago. That such a change should be made before our supply approaches any nearer to absolute exhaustion may be understood when we remember that many of the trees we are now cutting are centuries old. The desirable pine lumber of Michigan and of Wisconsin began to grow in the time of the French and Indian war; the hard Pine of the south must be two hundred years old or more to satisfy a lumberman. The Spruces of Maine furnish comparatively little saw-timber before that age, and the big Tulips and Cypress and many of the Oaks of the south, together with the magnificent giants of the Pacific, count their age by centuries. Our statistics are of the crudest, and it is useless to speculate how long our forest resources will last under the present methods of using them, but if these methods are not changed it is safe to say that a scarcity in desirable wood material will be pinching us within the next half century—that is, before a new crop can mature. Of course, we shall not stop or even materially reduce our consumption of wood until the necessity is at our doors, for it is the experience of the world that, in spite of substitutes and changes of condition, wood is so useful and indispensable to civilization that its total consumption does not abate. All this shows more than a lack of forethought. It shows among the people most interested an utter ignorance of the fact that the timber growing on an acre of land is a crop, and that it ought to be treated as a crop, just as Wheat or Corn is treated; that the growing of timber may be carried on as a business, and that this business requires skill and knowledge; that in our natural forests timber cutting and timber growing can be carried on at once, and that by a judicious use of the axe alone in old timber, a new crop of better quality and larger quantity to the acre can be reproduced.

There is no need to enlarge here upon the fact that in the south thousands of square miles have been made practically useless by erosion, which is directly traceable to the destruction of the forests there, nor upon such other established truths of general interest as that the destruction of forests intensifies floods, wastes the water which should be stored up for irrigating our plains, and injures crops and climate by allowing fuller sweep to drought-bringing winds. The need of preserving an assured supply of forest material is of itself enough to justify any effort at increasing the knowledge of practical forestry. That the agricultural colleges ought to be required to give some instruction on a subject so intimately related to the cultivation of the soil seems to need no argument. Many of the sciences on which agriculture is based must be studied by the skilled forester, and, therefore, these colleges are partially prepared to furnish the needed instruction. Several of them already do furnish instruction of a rudimentary and primitive character, but, until there are special chairs of forestry established, we can hardly hope that much technical education which will fit a man to manage forest property intelligently will be given. How men can be found to fill these chairs is a question to be discussed by itself, but, certainly, this educational problem is that part of the general forest problem which just now demands the closest study.

The Farm Home Reading Circle.

IN the latter part of the year 1892 the Faculty of the Michigan Agricultural College prepared a course of reading for farmers, gardeners, fruit-growers, stock-breeders, etc., to be used in what is designated the Farm Home Reading Circle. The object of this reading circle was to offer a systematic course of reading on agriculture and kindred topics, with books furnished at reduced prices through the Secretary, and provision was made by the State Board of Agriculture to have the printing, correspondence

and postage free, so that the books would be the only expense to members. Persons of any age were invited to join the circle. They were all entitled to the publications of the state experiment station, and they were encouraged to address questions on any doubtful points to the faculty of the college. When any reader completed a book he could obtain a blank from the secretary and make a written report on the leading topics of the work, and if this was satisfactory he was entitled to a written voucher which certified to this fact; when all the books in any one course, whether relating to the garden and orchard, to live stock, to soils and crops, or to any other special subject, was completed, the reader would be entitled to a certificate of the next grade, and on the completion of any three courses a diploma was to be issued.

Professor Mumford, who is the secretary of this circle, writes that it has met with unusual success. Three hundred readers are pursuing their work now, more than a thousand inquiries have been made, and twenty-five hundred persons have asked for circulars. In experience the course seems to be cumulative, and as one person reads a book he recommends it to a friend, who likewise reads it, and thus the circle widens. Expressions of appreciation have been received from influential farmers in many states, and from every evidence the course has begun a career of genuine usefulness. There can be little doubt that an organization of this kind will prove a genuine help to agriculture. The short courses in many of the colleges, schools of dairying, farmers' institutes and horticultural assemblies, like the one recently held in Chautauqua County, will accomplish a genuine service, even if they did no more than to bring farmers into contact with men of science, either personally or through books, and convince them that there is such a thing as scientific truth, upon which the best practice is always based. The young man, or woman, who reads a few books, will not be an accomplished practitioner in any branch of agriculture or horticulture, but if he is able to pass examinations in these works he will learn the value of study and mental application, he will learn how to think consecutively about his business, and he will know where to turn for information when he needs it.

The White Pine in the West.

THE White Pine has a peculiar record in the west. In Illinois and the greater part of Iowa it is one of the most satisfactory conifers that can be grown. I know of no tree anywhere that surpasses in symmetry and vigor a splendid White Pine-tree in the old James Smith homestead, south of Des Moines—a tree that was over fifty feet high when I last saw it, several years ago, and there seemed not a branch missing from its widely spaced, regular whorls. Along the Missouri River, in Kansas and Nebraska, White Pines can be found as vigorous and thrifty as any planted specimens anywhere. At the home of Hon. J. Sterling Morton, Nebraska City, are a number of White Pines of unusual beauty, the best of which is forty-nine and a half inches in circumference three feet from the ground, and forty-four feet eight inches high. Mr. Morton planted this tree thirty-two years ago, carrying it to its place in a water-bucket. It is thus seen that the White Pine grows as rapidly in the clayey bluffs of the Missouri River as in the sandy soils of Michigan. At Lincoln, Nebraska, only sixty miles back from the Missouri River, the White Pine is not a success. At Fairbury, almost due south of Lincoln, it does not compare with the other Pines, while at Franklin, more than half-way across the state, a few specimens have barely managed to exist during several years, in which the Scotch and Bull Pines have made vigorous growth. Nowhere back from the Missouri did I see vigorous trees, except at Salina, Kansas, where there are two good specimens twenty-four feet high, but these do not compare with the White Pines at Nebraska City, nor with the Scotch and Austrian Pines growing near them.

At Brookings, South Dakota, the same care that gave satisfactory results with Scotch Pine produced nothing but complete failure with White Pine. Five hundred transplanted trees, from ten to fifteen inches high, were received in fine condition, and were grown one year in nursery, being mulched during the hottest months. Very few died, but no appreciable growth was made. Good buds were formed, however, and the next spring they were set in forest-plots with White Birch and Box Elder. In three years not a Pine remained.

It would seem, then, that White Pine is not a promising species for planting much beyond the Missouri or in Dakota. In all the northern part of Missouri the White Pine can be successfully grown. At Columbia, half-way between St. Louis and Kansas City, and ten miles north of the Missouri River, there is a splendid avenue of White Pines on the old Rollins homestead, which average fifty feet high and show most satisfactory growth. Doubtless, the increasing aridity of the atmosphere west of the Missouri River is the reason of the failure of the species in that locality.

Washington, D. C.

Charles A. Keffer.

Marketing Apples.

SOME essential points to be considered in the marketing of fruit were given by Mr. George A. Cochrane in a paper read a few weeks ago before a meeting of the Massachusetts Fruit Growers in Worcester. We quote in a condensed form a few paragraphs, which will be found interesting to buyers as well as growers :

For several reasons the barrel is too large a package for apples, which should be marketed in boxes no larger than those used for oranges and lemons. Last fall I advised the trial of such a package, and suggested that each apple be wrapped in paper as oranges and lemons are. Three thousand cases were sent to me for shipment to Europe. Out of fifty growers of apples only three understood what a close selection of fruit meant, and the apples sent by these three growers sold in London at \$2.40 a case, when fruit in a barrel, which held three times as much as one of the cases, brought only \$4.00. Some growers sent windfalls, in the hope that wrapping them in paper would insure their safe arrival in England. Some sent Snow apples and Russets mixed in the same case. Of course, when barrels are used, new ones, and not second-hand flour-barrels, should be used, for, no matter what care is taken to dust and wash them, sufficient flour will remain in the seams or staves of old barrels to rattle out in transportation and dust the fruit.

In packing a barrel select a fair sample of the contents for the bottom layer. Place the apples, stems down, in the form of a ring, beginning at the outside, and having secured this layer firmly, place the second layer in so as to fit closely in the interstices, then fill the barrel quickly and gently, and when one-third full rock it slightly to settle the apples. Repeat this rocking when the barrel is about three-fourths full, and when it is filled place a padded board on top and rock it while the board is held down firmly. Then place in enough more apples to form a cone at least two inches above the chime. Now force the head down with a barrel-screw presser, nail the chime hoops, both top and bottom, securely, and have the head-lining sufficiently large to lap the presser that forms the head.

Never pack red apples until they are of a good color. It is an expensive blunder to wait until the last moment and then strip the tree of all its fruit. It is also a mistake to pick the apples faster than they can be packed. It is a good plan to go over the trees a week or a fortnight before the general picking and remove the well-developed and well-colored fruit and market it at once. Aside from the advantage of early marketing, such pickings help the fruit which remains, increases its size and improves its color. Apples should be headed up at once, and if they are to be held they should be hurried into cold storage as near a temperature of thirty-two degrees as possible. They should never be allowed to lie on the ground, and under no circumstances should they be exposed to sun or rain after being picked or packed. Fall varieties decay quickly, because they are exposed to a higher temperature after leaving the tree than the winter varieties are, and more fruit is lost after being picked in the heat than from the frost. Growers who keep apples in bins to market during the winter should

select and sort at the time of picking. Only perfect and healthy fruit should go into such bins. Cellars should be ventilated so that advantage of any change in the temperature can be taken and the fruit kept as nearly as possible at the required coolness. When the average temperature has been above forty-five degrees from the time of sorting up to December 15 apples should be marketed as soon after the turn of the year as possible. When they are kept in the bin after this time they will not stand rough usage and will not answer to ship to Europe in barrels. One reason why fall fruit does not pay arises from the fact that large quantities of delicate fruit is placed in one compartment, which, because it is air-tight, becomes overheated. Such delicate fruit ought never to be placed in barrels, except for near-by markets, and then only under the most favorable conditions of weather. Were American apples marketed in as sound condition as oranges are, if they were graded as oranges are as to quality and size, if they were wrapped and packed as oranges are, they would be worth three times as much as they now command in Liverpool.

Foreign Correspondence.

London Letter.

ASARUM MAXIMUM.—The genus Asarum has not hitherto claimed much attention from horticulturists, but *A. maximum*, now in flower at Kew, is certain to become generally liked on account of the large size and beauty of its flowers. It was first described by Mr. Hemsley, in *The Gardeners' Chronicle*, in 1890, from specimens collected in central China by Dr. Henry, who stated that it occurs in glens about Ichang Gorge on sides of cliffs, always some distance up, and that it is called "Ma-ti-hsiang" by the Chinese, who use the root medicinally. Mr. Hemsley described it as the largest of the genus known, the leaves being as much as eight inches across and eighteen inches high and the flowers two and a half inches in diameter, dull green, colored outside dark maroon-purple and velvety within, with a three-lobed conspicuous eye-like blotch of white surrounding the mouth of the tube. Except that the leaves are smaller, this description fits the plant now flowering at Kew. The leaves are not unlike those of *Cyclamen* in form and substance. In some species of *Asarum* the flowers have a strong aromatic odor, which is distasteful to some people, but *A. maximum* is odorless. The Kew plant was received from Hong Kong last year, and it has been grown in an intermediate temperature along with *A. macranthum*, *A. geophilum*, *A. Thunbergi* and *A. caudigerum*, all of which are natives of China. The genus *Asarum* is allied to *Aristolochia*. About a score of species are known, all of them being dwarf, with creeping rhizomes, cordate leaves, and short-stalked flowers, which are developed from the axils of the leaves, generally in tufts, the perianth being fleshy, tubular, with three broad spreading lobes. A figure of *A. maximum* has been prepared for the *Botanical Magazine*.

SHORTIA GALACIFOLIA.—This is not merely a botanical curiosity; when well grown it is a very pretty plant, quite equal in attractiveness to many of our most popular alpines. This week a plant of it was shown from the garden of Lady Bowman, Joldwynds, Surrey, which was awarded cultural commendation by the Royal Horticultural Society. It was in a pan nine inches in diameter, and was a large tuft of healthy green, brown-tinted leaves, from which sprung over fifty flower-scapes, each six inches long, many of them bearing a pair of open flowers. The bell-shaped corollas were an inch long and wide, white, with a pale flush of rose. Mr. Cornish, Lady Bowman's gardener, who is a clever cultivator of herbaceous and alpine plants, grows the *Shortia* in a mixture of sandstone and peat and keeps it in a cold frame, where it is sheltered from bright sunshine during the summer. We owe the *Shortia* to the Alleghanies, and possibly it is grown in American gardens better even than at Joldwynds; if not, then it is certainly worth trying.

VIBURNUM RUGOSUM.—This is the *Laurestinus* of the Canary Islands, whence it was introduced into English gardens

about a century ago and is still in cultivation here, though sparingly, as a greenhouse plant. It deserves to be better known, as it forms a sturdy shrub, is evergreen, its leathery, corrugated ovate leaves being five inches long and covered with a ferruginous down. The flower-heads, which are terminal, are like those of the common *Laurestinus*, but much larger, being four inches across and densely packed with pure white flowers, in which the pink stigma is an additional charm, and the odor powerful and agreeable. Some plants of it at Kew, raised from cuttings rooted two years ago, are now nice little shrubs two feet high, with fine heads of bloom, and they have been in flower several weeks. In places where this plant could be grown in the open air it would be an excellent spring-flowering shrub.

EUCHARIS STEVENSII.—Examples of this plant were exhibited last Tuesday and obtained an award of merit. It is said to be a hybrid between *Eucharis Sanderi* and *E. candida*, and it closely resembles the former, which Mr. Baker believes to be a natural hybrid between *E. candida* and *E. grandiflora* (*Amazonica*). The flowers of *E. Stevensii* are of medium size, and they are borne on long scapes, the plants flowering freely. It was first flowered in 1885, when it was supposed to be *E. Mastersii*, a species introduced by Messrs. Sander & Co. from New Granada in 1885. The plants shown last Tuesday were from the garden of the Duke of Sutherland at Trentham. They were in five-inch pots, and each bore one or two strong scapes of bloom. There is one grand *Eucharis* and about half a dozen others, which would be considered first-rate were it not for this one, namely, *E. grandiflora*, the most useful of all tropical bulbous plants. The habitat of this *Eucharis* is still unknown.

BEGONIA, PAUL BRUANT.—I noted this useful hybrid as being in flower at Kew in February last year. This year it is later, a group of it being at its best now, the middle of March. The plants were struck in the summer of last year, and they are now a foot high, and bear large drooping clusters of elegant pale pink flowers, which remain fresh on the plant for several weeks, as they are nearly all female. There is a good picture of this *Begonia* in the *Gardeners' Magazine* for this week.

BEGONIA, GLOIRE DE SCEAUX. is much better this year than it has ever been, plants nearly a yard high being clothed with shining bronze-tinted foliage and bearing large erect trusses of rose-pink flowers. It was figured in *GARDEN AND FOREST* last year, page 185, the plant represented there, however, being small compared with those in flower now at Kew. I consider this one of the best of the winter-flowering Begonias and one of the most distinct. It is one of the now numerous progeny of *B. Socotranica*.

THREE GOOD GREENHOUSE PRIMULAS.—In the conservatory at Kew there are now groups of many kinds of spring flowers, and three of the most attractive are composed as follows: (1) *Primula floribunda*, rich yellow, and the double Chinese *Primula*; (2) *P. verticillata*, pale yellow, and *Lily-of-the-valley*; (3) *P. obconica* and red single Chinese *Primula*. A pleasing effect is obtained by arranging the plants in groups composed of one or two distinct things, much more so than when the plants are mixed indiscriminately. There is no need to recommend *P. obconica* as a garden-plant. It is a beautiful and most useful early spring-flowering plant for the conservatory. *P. floribunda* is not so well known. It was introduced to Kew from the Himalayas in 1883, and has been grown here ever since. Treated in the same way as *P. obconica*, it forms compact leafy plants in five-inch pots, the whorled leaves bright green, and the flowers crowded on erect scapes nine inches high, their color rich egg-yellow, and, although only half an inch across, they made a good show. *P. verticillata* is the third good greenhouse species, which is not generally grown. It forms a tuft of leaves nine inches across, something like *P. vulgaris*, but thinner, more distinctly toothed, and the surface covered with whitish flour, as in *P. farinosa*. The flower-stems are a foot high, and they bear several whorls

of leaves and two or three whorls of flowers, strong stems having twenty flowers in each whorl; these are semi-drooping, and have a tube over an inch long, a limb half an inch across, their color being primrose-yellow. Plants of these in five-inch pots are very decorative when in flower. At Kew these three Primulas are raised annually from seeds, and grown in frames along with and treated the same as *Cyclamen Persicum*. *P. verticillata* is a native of Arabia, although it is called the Abyssinian Primrose in gardens.

VIOLET, PRINCESS BEATRICE.—This is a new Violet, which was shown last Tuesday from the Queen's garden at Osborne, Isle of Wight, and received an award of merit. It is the largest-flowered Violet grown here, the flowers being an inch and a half across, the stalks nine inches long, and the leaves three inches in diameter. Its color is rich blue-purple, brighter than the color of Victoria, which was also shown, and its fragrance quite equal to that of any of the big-flowered Violets. Mr. Nobbs, the gardener at Osborne, says that he found this new Violet growing in an uncared-for part of the garden, and that Her Majesty, who is fond of Violets, prefers it to all others, and desired that it should bear the name of Princess Beatrice. I have not seen the new American Violet called California, but those who have say it is very similar to this royal waif. There is an enormous trade done in Violets in England in the first four months of the year, as they are universally popular with flower wearers. The large-flowered, bright-colored varieties find most favor with ladies.

STRAWBERRY, STEVENS' WONDER.—This is a new variety which obtained a first-class certificate last Tuesday, when Mr. Stevens, a Sussex nurseryman, exhibited plants of it in pots and bearing exceptionally large crops of large, handsome, well-colored, highly fragrant fruit, which in form may be described as intermediate between Noble and Sir Charles Napier. The leaves are small, dark green, with short stalks, and the fruit-stalks short and firm. Mr. Stevens had plants of it in full bearing on February 21st, when he sold the fruit to Mr. George Munro, the Covent Garden salesman, at six dollars per pound. I saw a letter from Mr. Munro, in which he stated that this Strawberry was the best for early forcing that he had ever seen, as the fruit was large and of good flavor. The pale color would, perhaps, be against it later in the season. Some plants grown in six-inch pots produced from twenty to thirty fruits, the largest being one and a half ounces in weight. Growers of early strawberries reckon that there is sure to be a large demand for Stevens' Wonder.

London.

W. Watson.

New or Little-known Plants.

*Mimulus Clevelandi.**

THIS species (see figure, page 135), one of the handsomest of the genus, was found on the south side of Cuyamaca Peak, in southern California, not far from the signal station on its summit. It grows in patches, spreading by underground roots. Among loose rocks the stems attain a height of two feet, but on exposed slopes their length is considerably less. Although growing at a much greater elevation (over 6,000 feet) than *Mimulus glutinosus*, its stems are woody, though short. It connects that species more closely with the sections *Enoe* and *Eunanus*, which have in most cases the same dehiscence. It is now in cultivation in San Diego, and it will be of interest to observe

* *Mimulus Clevelandi*, n. sp. Perennial, suffrutescent at base, 3-6 dm. high, glandular-pubescent throughout; stems many from the base, sparingly branched above; leaves lanceolate, serrate, 3-7 cm. long, narrowing to the clasping base, in age revolute on the margins; flowers shortly pedicellate; calyx 2 cm. long, contracted above the ovary, the upper and longer portion curved and spreading, the lanceolate, somewhat unequal teeth $\frac{1}{2}$ the length of the tube; corolla golden yellow, nearly twice the length of the calyx, with gradually dilated throat and widely spreading nearly equal lips; style stout, minutely and densely glandular; stigma tubular-peltate; mature capsule 10-12 mm. long, nearly quadrangular, tapering slightly toward the apex, opening to the base by the upper suture, the lower separating for only a short distance from the tip, and each valve splitting at the tip for nearly the same distance as the lower suture; placentæ separate, as in *M. glutinosus*; seeds foveolate, apiculate at both ends.

whether its stems become longer or larger in this milder climate.

The species is named in honor of Mr. Daniel Cleveland, whose name is so well known in connection with the flora of San Diego County.

San Diego, Cal.

T. S. Brandegee.

[Judging from herbarium specimens, this *Mimulus* ought to be a good ornamental plant in California or southern Europe. Of course, it would not be hardy here, and it is hardly probable that it would make a good greenhouse plant, but, in dry climates, where it could be watered, it might become a large shrub and flower throughout the year.—ED.]

Plant Notes.

LEUCOJUM VERNUM.—Although not one of the very earliest spring-blooming bulbs, this Spring Snowflake, as it is familiarly known, in favorable situations follows closely the Snowdrops and Crocuses. It is like a very large Snowdrop; the white flower, with yellowish green tips to each petal, is graceful and charming. It should be planted in clumps, in well-drained soil, in a sheltered place, and not disturbed after it has once become established. Although long in cultivation, the Spring Snowflake is by no means common in American gardens, probably because it is not so easily handled as most bulbs, and does not thrive except under the conditions noted above. The bulbs are cheap and easily obtained.

STROBILANTHES DYERIANUS.—This new bedding-plant belongs to the Acanthus family, and is one among its many plants remarkable for bright-colored foliage. It is nearly related to the better-known Goldfussias and Ruellias, but is of no value as a flowering plant. It is soft-wooded, having the thick nodes that characterize the order; stout, erect stems and opposite leaves. When kept in vigorous growth the foliage is remarkably beautiful, of a rich iridescent purple, with green veins, and slightly suffused with steel-blue. The plant, however, if left alone soon runs into flower and then becomes ragged and shaggy. The flowers are individually quite pretty, about an inch long, labiate, almost regular, and pale blue in color. The inflorescence is a loose-bracted spike, rather large, but not pleasing in appearance. The chief value of this new species is, therefore, as a foliage-plant, and then only for outdoor use. Whether or not it will prove superior to the darker varieties of Coleus as an effective bedding-plant remains to be seen. It will probably form beds of a more striking and characteristic appearance, and doubtless deserves a good trial. The culture is very easy; cuttings may be rooted in a brisk bottom-heat in two or three days and when potted in rich, fibrous soil, and kept warm and moist, they will grow rapidly. Plants can be propagated by cuttings, like Coleus, or by means of single eyes, with a leaf attached. As the leaves are opposite, the stem may be split, and two cuttings made of each node. This method, by which a larger number of plants can be made from limited stock, is very good, but a single eye will not produce a plant as rapidly as a growing top.

BEGONIA FEASTII.—A Begonia is occasionally seen in the gardens of the eastern states labeled with this name, although it is sometimes grown under other names, or with no name whatever. In a note about this plant, which he considers the most useful of the winter-flowering kinds, on account of the ease with which it is grown and its neat compact habit, Mr. Michael Barker, of Cornell University, says: "I am now well satisfied that it is a hybrid of American origin. I do not remember to have ever seen it in European gardens, and it is not catalogued by any of the European dealers, at least as *B. Feastii*, and I have never been able to find a figure of it. The only references to it which I know are two slight ones in *The Gardeners' Monthly* for 1885. It is there said to be a hybrid, raised by the late John Feast, of Baltimore, Maryland, from the old species, *B. hydrocotylæfolia*, as one of its parents, but the other

does not appear to have been known. The stems are thick and spreading and well furnished with prominently veined leaves, deep green on the upper surface, and reddish be-

suppressed; but, from a decorative standpoint, the broad-winged ovaries make up for all other deficiencies. The ovaries proper are of greenish white color, the wings and



Fig. 20.—*Mimulus Clevelandi*, n. sp.—See page 134.

neath. The staminate flowers are inconspicuous, dropping from the plant at an early stage of their existence; but the pistillate blossoms are better developed, showing perfect stigmas and two small orbicular sepals. The petals are

sepals bright pink." Mr. Barker sends a photograph of this Begonia in flower, which shows a plant of neat and distinct habit and graceful inflorescence. We should be glad to receive any additional information as to its history.

Cultural Department.

Some Flowering Plants for Easter.

MOST private greenhouses are called upon for flowering plants for church, house or conservatory decorations at Easter-time. This year the date is later than for several seasons past, and a good deal of forethought and judgment is required to have some varieties in flower at the right time. Easter Lilies are the most important crop, and one of the most difficult to have in condition at a required time. As a rule, if the buds just begin to show when Lent begins the flowers will be on time without forcing the plants unduly. By hard forcing we have had plants flower in March, even when the buds were only seen four weeks before Easter. If brought on in an ordinary greenhouse temperature, six weeks is not too long a time to allow, even if the plants are not needed until the middle of April. *Lilium longiflorum* requires fully a week longer to develop than *L. Harrisii*; *L. candidum* taking about the same time as the last named. We use eight-inch pots of Lilies. The largest bulbs are grown singly, while the small ones are placed three in a pot. The average product of the larger bulbs is from eleven to fifteen flowers, while the smaller ones produce from six to nine flowers.

The herbaceous Spiræas are indispensable Easter plants. They should be allowed from eight to ten weeks for flowering after they are potted. *Spiraea Japonica* is still more largely grown than any other variety, but its variety, *Grandiflora*, now that it is becoming cheaper, will largely supersede the older plant. When well grown, it makes a beautiful pot-plant. *S. astilboides* forces very readily, but it has not the compact habit of the other two varieties. It grows much taller, and is worth growing for variety. *S. palmata* we do not find satisfactory. Spiræas should be removed from the house or stood on the floor and covered with paper while the place is fumigated, as the foliage is very easily scorched, and large numbers of plants are ruined every year through neglect of this precaution.

Hydrangeas, especially *H. Otaksa*, make admirable Easter plants. We began to force our plants at Christmas, and the flower-heads will be well expanded early in April. Cuttings inserted early in February and potted off when rooted, if planted out-of-doors toward the end of May, and watered during droughty weather, will be fit for eight-inch pots in September. Such plants give from eight to twelve good panicles each, and cuttings rooted later in the season will flower well. Plants grown in pots all the season and plunged in a bed of ashes have not proved as successful with us as those planted out.

Azaleas are among the most popular of Easter plants. Owing to the lateness of Easter this year, it is impossible to hold back some varieties, notably the beautiful double kind, *Ver-væniana*, but *A. Borsig*, double white; *Impératrice des Indes*, double rose, edged with white; *Sigismund Rucker*, rose-pink, bordered white, dark blotch; the magnificent *Madame Van der Cruyssen*, rose, with spot on upper petals, and one or two other kinds will be in season if held in a house with a northern exposure or in a cold frame until a few weeks before they are needed. Plants of *A. mollis* are among the best forcing plants, and a few of these are always a welcome addition at Easter.

Cytisus, in six to eight inch pots, which have been clipped into shape during the growing season, and held back in a cold house, make excellent Easter plants. *Cytisus racemosus* is much superior to the older *C. Canariensis*. Some kinds of more recent introduction have much larger racemes, notably *C. elegans*. The flowers, however, are produced less freely than on the older sorts.

White Marguerites, or Paris Daisies, are very useful for church or conservatory decorations, and cuttings inserted in October, if grown along in an ordinary greenhouse, will make fine bushy plants in eight-inch pots by Easter-time. The variety *Maximum* is the most serviceable; the yellow-flowering varieties, *Comte de Chambord* and *Etoile d'Or*, flower unsatisfactorily, and are rather straggling in habit.

Deutzia gracilis is one of the best forcing shrubs and can be quickly pushed along at this season. Cuttings of soft wood strike very freely, and make nice plants if planted out for two years. The plants, when of sufficient size, should be grown along in pots all the time and plunged during summer in a bed of ashes. Plants dug out of the ground, potted and forced, yield plenty of bloom, but the quality of the flowers is inferior to that of pot-grown plants.

Callas are always in large demand for Easter, and the old *Richardia Æthiopica* is still altogether the best. The variety, Little Gem, so loudly praised, can hardly be called a success as a winter bloomer. Until the middle of February our plants

hardly showed a flower, and while it is now blooming fairly well it does not equal the old variety in its free-flowering qualities. Many growers have become discouraged with Little Gem and have discarded it entirely, but a few plants well flowered are quite effective in decorations.

Some of the Begonias, especially the Manicata section, will be in good bloom for Easter this year, and are certainly beautiful when well flowered. *B. semperflorens gigantea*, with its brilliant carmine-red flowers, borne in large panicles, is one of the finest of its class. From cuttings inserted now large bushy plants can be had for next winter. Planted out in a partially shaded border, all the fibrous-rooted Begonias do well in the summer, and if carefully lifted and potted in September sustain very little check.

Easter generally comes too early for the flowering of fancy Pelargoniums, or Lady Washington Geraniums, as they are commonly called. This year a number of our plants promise to be in good bloom. No soft-wooded plant equals in beauty a well-flowered Pelargonium, and it is satisfactory to note that they are gradually coming into popular favor again. Cuttings rooted in September and potted and grown along in an ordinary greenhouse, make good plants in six-inch pots at this season; older plants cut back are, however, preferable. Good varieties are *Volonte Nationale alba*, *Mrs. R. Sandford* and *Princess Teck* for white; *Madame Thibaut*, a beautiful rosy pink, and *Kingston Beauty*, white, with maroon blotch.

Cannas, potted in the fall when the roots are lifted from the beds, are capital winter-flowering plants and make a brilliant show at Easter. We grow our plants in eight or ten inch pots in a moderately warm greenhouse. *Madame Crozy* is still the best of this family as a pot-plant; *Alphonse Bouvier* and *Charles Henderson* are good of their color, the first-named being the most satisfactory winter bloomer here. *Florence Vaughan*, although not a free winter bloomer, is now in full flower.

Cinerarias will be mostly spent before Easter-time, but herbaceous Calceolarias more than make good this deficiency, and well-grown plants are highly decorative. White Stocks are useful plants, and for decorations we use the kind known as Boston Florist. Antirrhinums make good pot-plants and can always be had in flower for Easter. Bulbous plants, such as Hyacinths, Tulips and Narcissus are always popular, and very little forcing will be needed this year to have them in flower. Two of the most useful Orchids at Easter-time, *Cattleya Trianae* and *Cœlogyne cristata*, are now on the wane. Plenty of material is available among Odontoglossums, Cattleyas and Lælias, to say nothing of other genera of Orchids, to make a good display, where these plants are grown.

Taunton, Mass.

W. N. Craig.

Japanese Anemones.

THERE is no more suitable plant for piazza, porch or hall decoration than the Japanese Anemone. As a pot-plant it is unexcelled, and fully repays any extra attention given to it. Though generally grown as a hardy perennial, it is not entirely successful as such. The flowering crowns are frequently destroyed during severe winters; but, as every piece of root develops adventitious buds in the same way as our native *Anemone Pennsylvanica*, the plants are seldom killed outright, and will shoot up again later in the season, but generally too late to make strong blooming crowns before frost. By storing our plants in a cool cellar we avoid this drawback; and as they do not lift well when planted out, we find it better to repot them every year. We shall overhaul our plants in a few days, potting them in good heavy loam and well-decayed manure in the proportion of one-third of the latter. We use twelve-inch pots, as our clumps are large, containing eight to ten crowns. Small plants, such as are obtained from the dealers, might be put three together in eight-inch pots, making effective plants by the autumn, and these would be large enough for twelve-inch size next season. It will be found in repotting old plants that they have in the course of the previous season made a number of fleshy underground stems. These had better be trimmed off, for if left they will grow and fill up the pot with a lot of useless growth, impoverishing the soil. These stem-like roots develop plantlets from every bit, and so, if any stock be required, it would be well to make a thin layer of them in boxes, with a covering of sandy loam. This is the way the dealers obtain their stock. If, after being potted, the plants are put into cold frames and encouraged by husbanding a little sun-heat the latter part of the day, and slight protection at night, they will make some growth, which will place them two or three weeks in advance of their natural season of blooming. We get ours into bloom early in August, and they continue to flower until November. Having started

them into good healthy growth, we gradually harden them for exposure about the end of May. Being considered hardy plants, it is natural to suppose that they will bear exposure well. They do not, however, when forced in any way. The young leaves are likely to be disfigured by a chill, and as these leaves remain on the plant all the season, it is important to preserve them. I remember, too, when the thermometer fell to thirty degrees, Fahrenheit, on the last night of August, 1888, all the flowers and buds were destroyed. This has not happened since. When well established, abundance of water should be given. In general, the treatment given Chrysanthemums will answer for them.

These Anemones make good specimens. The handsome vine-shaped foliage and the white or pink saucer-shaped flowers harmonize beautifully. The flowers are borne on stout umbellate cymes, and are nearly two inches in diameter on well-grown plants. By the use of light stakes, such as Privet-canapes make, a good plant in a twelve-inch pot may be spread to three or four feet, and yet be well furnished. They stand the wind and weather well. The variety known as Honorine Joubert is the best white variety, and *Anemone Japonica hybrida* the best pink.

Wellesley, Mass.

T. D. H.

Snowdrops, New and Old.

AS a compensation for the backward season which has retarded some flowers from thirty to sixty days, we have a rather better show of bloom at this time than in seasons when plants flower normally. The earliest Snowdrops are just disappearing as the first buds of Narcissi are showing. Usually we are favored with periods of open weather during the winter, when the early flowers expand. There were no mild intervals during the winter just ending, so that Snowdrops did not open before the end of February, and until lately other winter-flowering plants have had little chance to overcome the obstacle of nightly frosts. The background of snow which is the foil against which these early flowers are usually seen is missed this year.

Snowdrops are now in midseason. The flowers of *Galanthus Elwesii* are about gone, but various other species and varieties are in full flower or not yet open. It is pleasant to note the fine acquisitions to Snowdrops from year to year, for while the older varieties are lovely flowers and not to be discarded, we have now many new kinds, with much larger flowers and in some cases very distinct foliage.

Whenever many gardeners are interested in a certain plant there is a tendency to name varieties on very slight variations, but there are really striking differences in the Snowdrops, which would be more distinctly seen if the foliage was more forward when the flowers are at their best. *Galanthus Cassaba*, which was received from Mr. Whittall last year, has much improved this season, and in respect to size and vigor is among the best Snowdrops in the collection, while inferior to none in beauty. The flowers have sepals over an inch long and rather broad. The petals, marked like those of *G. Elwesii* with green to half their length, have green lines at the apex. The ovaries are a yellowish green. The stems are very thick and upright. The bulbs, which have a long neck, are as big as those of an ordinary *Narcissus*. The leaves are pointed, broad, somewhat *Scilla*-like and glaucous. I believe this is a variety of *G. Elwesii*, and that it was collected near Aidin. A variety sent me by Dammann as *G. robustus* is identical with *G. Cassaba*.

Galanthus Imperati Atkinsi is equally as large and vigorous as *G. Cassaba*, and as the scapes are less stiff it is rather more pleasing in the border. It has the objectionable habit of trying to double its petals, but this objection would not deter one from growing all he could secure of it. Its petals are white, with the exception of green markings on the sinus. This is the most effective Snowdrop in the garden.

Plants of *Galanthus Elwesii* Aidin did not ripen as well as in their native habitat, as they are not as vigorous or prolific as the collected bulbs were last season. Still they prove to be a neat, distinctly marked variety. Some of them still retain their tendency to produce twin-flowered scapes. Last year I discovered one with a most curious twin-flower, which at first glance seemed one of ordinary form. The ovaries of these flowers were flattened at one side where they met, and from each grew only two sepals instead of three, as usual, so that the outward appearance was quite normal. Among these was also a pallid form, of color similar to *G. lutescens*, which is a variety of *G. nivalis*. This has retained its form this year, and as its petals are white with only the faintest suspicion of yellow dots, it is worth a name if it will increase. *G. Ikariæ* Mr. Whittall had collected in the Island of Nicaria. It has wide strap-shaped leaves, light green in color. This proves to be

late, and it is not yet in good form. It flowered well last year with medium-sized flowers, the petals of which, if I remember rightly, had the markings on the sinus connected with the green of the base. It is a very distinct variety.

Galanthus Elwesii unguicularis is a form which has been separated and named, I suppose, from the claw on the spathe. At present it might be matched by some of the types of the collected *G. Elwesii*, among which there is considerable variation. By the way, whoever buys *G. Elwesii* should give the preference to collected bulbs. Cultivated bulbs may sometimes be larger, but the grower will probably retain the finer forms for part of his toll.

Galanthus Ochrospeilus is another of Mr. Whittall's latest finds, and this season flowers for the first time in cultivation. It appears to be a small-flowering kind, oddly marked with a short, green, narrow line on each sinus, and similarly marked at the base. The tube is somewhat constricted at the opening.

A variety from Samos, of last season, does not seem distinct, and differs little from plants from Bithynia, both being forms of *Galanthus Elwesii*. One of the Snowdrops which I most value is Mr. Allen's hybrid, *Charmer*, a flower of fine form, much substance and perfect vigor. Among flowers of great purity the variety of *Nivalis G. Melvelli major* is in the front rank; it is a dwarf kind. Snowdrops unopened, or in the bud stage, are very fascinating, and I enjoy best the long-pointed forms. Of these, *G. Caucasicus* is one of the most pleasing, a happy medium between the narrow *Nivalis* and the broad *Elwesii*. There are numerous other Snowdrops in the garden which I have not had time to study, but it may be well to call attention to one which is especially curious, *G. Scharlockii*, which might be called the horned Snowdrop, as its divided spathes resemble horns in outline. The spathes of Snowdrops are interesting. If a rising Snowdrop is observed it will be noticed that the flower is upright and is enveloped in the spathe, which is mostly a thin transparent membrane. At the proper time this splits at one side usually, and the two edges roll up toward each other till it appears, on a casual glance, to be merely a flat leaf-like appendage, whose top is bent over the pedicel of the flower. In *G. Scharlockii* and a few other kinds the spathe splits in two parts. This Snowdrop has green markings on the outer petals, which are rather blunt. It is not particularly handsome, though well worth growing. It is vigorous and increases rapidly. Most Snowdrops do well in my garden, though they receive no special care or treatment. There are some, however, which will not stay with me. The autumnal flowering ones have disappeared. They seem of too delicate a constitution for the open border, where my scheme of gardening does not embrace any attempt at coddling. *G. plicatus* has not survived with me, though I believe it is not usually a miffy kind. *G. Forsteri* apparently needs a moister richer soil than most kinds, for it still refuses to give me flowers of size and substance.

J. N. Gerard.

The Cherry Fruit Mold.

IT is a good thing to grow cherries in abundance, provided the grower harvests his crop, but to have a score or more of large Cherry-trees loaded with fruit left unpicked is a menace to the whole neighborhood. It should be remembered that such fruit left upon the trees, especially if the weather is moist, will develop, literally by the bushel, a fruit mold which is well known from its gray color and soft, powdery feel. This fungus, *Monilia fructigenum*, is not confined to the Cherry-tree, and on this account one can consciously raise complaint against a neighbor who lets the fruit on his Cherry-trees go to decay. The Plum and the Peach are similarly attacked, and the Plum especially is often seriously injured, the whole crop going off just before the time for picking. Suppose the Cherry-trees full of fruit, ripe and decaying. This crop comes before the plums, and the whole atmosphere is charged with the spores of this gray mold of the Cherry. These spores germinate very quickly, the winds carry them in all directions, and the Plum-trees anywhere in the vicinity of such Cherry-trees will receive a full supply of them, so that the fruit cannot escape decay. Spraying will do much to prevent the loss of the plums; but a man will need to be almost constantly in his Plum orchard administering the remedy to counteract the effects of the few large Cherry-trees that were distributing spores throughout the neighborhood.

The Peach in like manner is affected, but coming still later is not quite so apt to be influenced by the crop of *Monilia* on the Cherry-trees as the Plum; but the Peach is attacked somewhat earlier in its stage of development. The surface of the fruit being covered with a down is better able to hold the spores than the smooth surface of the plum, and in that way

the growth may take place while the peach is yet green and hard.

There are many Cherry-trees throughout our middle states that have passed their stage of usefulness and are now doing considerable damage to orchards that otherwise might be profitable. One needs only to drive through the country in almost any direction to find giant Cherry-trees carrying inferior fruit, out of reach of pickers, and comparatively worthless if gathered, which serves as propagation places for one of the worst enemies of the stone fruits. Such trees in many cases could be spared; their owners ought to cut them down. Trees after they have passed their stage of usefulness are not always a source of infection to other trees; but it is manifestly true in the case of the Cherry, which becomes a place for the rapid and abundant propagation of a microscopic enemy to other stone fruits.

Rutgers College.

Byron D. Halsted.

Yellow-fruited Tomatoes.

THERE are four distinct classes of Tomatoes as regards the color of the fruit; and in this case there is a more than usually intimate association of other qualities with that of color. Of the red tomatoes there are the deep, dark red varieties, like Perfection, Favorite, Ignotum, Optimus and Ponderosa; and a very distinct lighter pinkish colored group of such as Beauty and Dwarf Champion. These are very distinct also as regards texture, flavor and appearance of the flesh.

The yellow varieties are similarly divided into two classes, of which the old-fashioned golden yellow apple-shaped fruit represents the first type. There is almost a metallic lustre to the skins of good specimens of this type. Concomitant characters of this group are thin septæ, tough flesh, large and abundant seeds—a general assemblage of undesirable qualities. The Yellow Trophy seems to fall into this classification here, though, wherever I have seen it it has been very unstable, showing usually several fruits of the next class; and I have often wondered if the seedsmen who sent out the seeds had not selected them from the better strain, and if the trouble was not simply in a reversion of the majority to a type evidently preventient.

The second division of yellow varieties contains strains of later origin, considered either historically or biologically. Golden Queen and Golden Sunrise are the proper representatives of this group, though other names, not well authorized or permanently adopted, have been found to cover similar varieties. The Shah, said to be a sport from Mikado, is also of the same color. These tomatoes are not properly yellow, but are cream-colored, much duller than the other yellows, and not at all metallic in lustre. At the same time they have thick meat, fleshy septæ, small seed cavities, are grainy and tender in texture and pleasantly mild in flavor.

This last group, it seems to me, has not received nearly enough attention, either from amateur or professional horticulturists. The varieties already named, though, perhaps, not so stable as might be desired, have superior table qualities when grown in their perfection; and if this were generally understood, so that the demand for seed might gain some proportions, they would present a fine field for work in seed selection. They are milder in flavor than the best red varieties; and for eating sliced are much finer, according to my taste. Their appearance on the table is also quite as attractive as that of any fruit.

Monsieur G. Alluard, in the last number of *Revue Horticole*, 1895, p. 110, expresses a very high opinion of the yellow varieties. He says: "The best yellow varieties of the tomato make a very appetizing, clear yellow purée, which gives completely the illusion of a fine stew of fruit. The flavor is equal to that of the best red varieties. They are very much better than the red tomatoes for mixing in sauces to which one wishes to give more or less of a tomato flavor. Their color permits this to be easily done, whereas the ordinary tomatoes impart to the sauces a very undesirable red tint. They serve equally well with red tomatoes for making very pretty salads, either in a mixture of alternate slices of the two colors, or put upon separate plates, and garnished with a fresh border of chervil. And lastly, one may use these fine fruits, either separately or in clusters, for garnishing desserts."

It also seems to me that the cream-colored sorts would be superior for canning, though I have not seen them tried. At the canning factories color is a very important quality, the pink varieties, so I am told, being entirely discarded because they do not present an attractive appearance on coming out of the can. Now, I should expect nicely canned specimens of Sunrise to be as handsome as canned peaches when opened. They are somewhat suggestive of peaches when served sliced and

fresh, and are almost as good as that standard of superlative excellence when eaten with sugar and cream.

Oklahoma Agricultural College.

F. A. Waugh.

Onosma stellulatum.—It was a great pleasure the other day to see in the nurseries of J. W. Manning, at Reading, Massachusetts, a good lot of this beautiful and rare hardy plant, for this is one of the plants that are never forgotten after they are once seen. The Onosmas belong to the Borage family, and all have the characteristic rough foliage; very few are desirable garden-plants, but *O. stellulatum* is an exception, and its drooping heads of bright yellow sweet-scented flowers justify the garden name of Golden Drops, which has been given to it. This same plant is often known as *O. Tauricum*, and the authorities seem now to regard the latter as a fixed yellow-flowered form of *O. stellulatum*, the flowers of which vary from white to various shades of yellow. There is a difficulty often experienced in keeping the plant for any length of time under cultivation, and it is caused in most instances by planting it on a level ground and in soil that is retentive of moisture. A sharp sandy soil, not over rich, and sloping toward the sun, is admirably adapted to its culture. After flowering, the first opportunity should be taken to put in a few cuttings, which should be taken off with a hard base and placed in clear sand, where they will root without trouble, and duplicates can then be had to make good a possible loss. Our losses have invariably occurred during a protracted wet period in dog days. Heavy showers will then bespatter the foliage with soil, and the plants fall an easy prey to damp before the danger is noted; hence the desirability of planting in free soil and the usefulness of placing small stones under the plants to keep the earth cool and protect the foliage. *O. albo-roseum* is an annual species, with which we have never been able to succeed; and we have still another species from seed sent from Asia Minor, but this is not old enough to bloom yet, although it promises to do so this season. Of some seventy species of this genus, the above are about all that are in cultivation now, the rest not being introduced yet.

South Lancaster, Mass.

E. O. Orpet.

Lettuce for Forcing.—Every one who tries to keep up a supply of lettuce during the winter months knows the value of a reliable variety. With so many new and old kinds now offered, it is only by experience we can find out which one is most satisfactory when all things are considered. Of several kinds which we tried this winter, Rawson's new Hot House approaches most nearly an ideal Lettuce for forcing. It was grown alongside of some old favorites, such as Boston Market, Tennis Ball and others, but it easily leads all of them. It grows to a large size, hearts quickly and well, has a delicate flavor, and resists damp better than any variety we have ever grown.

Tarrytown, N. Y.

William Scott.

Correspondence.

Oranges in Southern Mississippi.

To the Editor of GARDEN AND FOREST:

Sir,—In what may be called ordinary or average seasons oranges ripen well in southern Mississippi, but killing frosts come every few years, so that while oranges are grown here as a luxury they are never considered as a reliable, staple crop. Nevertheless, immunity from cold waves for a few seasons gives every one a sense of security, all precautions against the frost are neglected and then the disaster falls. About this enchanting coast town, in the extreme southern part of the state, up to holiday week, the Orange-trees were loaded with fruit; our Christmas oranges came fresh from a grove in full bearing, and no fruit was ever more beautiful. Then came the sudden drop in temperature, and every orange on the trees was frozen to a solid cake of ice. All the leaves and tender limbs in the groves died, many fine trees were killed outright, and since New Year's there have been three more periods of distinctly freezing weather, to complete the destruction.

The special purpose of my letter, however, is to say that one grove here escaped destruction and is now showing signs of returning growth in every tree but one. The owner is an intelligent Italian, and it may be worth while to give his method of treatment. He says that his father cultivates oranges near Naples, and his practice is the one generally employed there as a safeguard against periods of excessive cold. In autumn he scrapes away the rich top soil from the roots of his trees and allows them to dry, and since he irrigates his grove he at this time withdraws all water. The trees then are at rest, except for the ripening fruit, which seems to be as good as that in

irrigated groves. If freezing temperature comes, these exposed roots freeze with the tree, and yet he claims that their dormant condition and lack of sappiness protects them from harm. As to the correctness of his theory I am not able to pass judgment. I only know that his trees stand with bared roots all winter until there are signs of spring and returning vitality and flowing sap, when he applies his fertilizers and throws back the soil and begins to irrigate. I should add that he does not give his fertilizers all at once, but in moderate amounts every few weeks as the tree needs it. As he waters the trees and fertilizes them as they need feeding, so he keeps down all grass and weeds during the spring and early summer, so that they cannot rob the grove and prevent the trees from securing the full benefit of the food. The one tree lost stood in the rear of his house where the waste water from the kitchen reached its roots. This tree was in growing condition in the autumn and the frost killed it. My attention was called to the fact that after the first frost every Orange-tree in his grove cast its leaves, which their proprietor noted as a sign of life, for trees struck by lightning or otherwise deadened hold their dead foliage apparently without the power to cast it off.

G. T. Drennan.

Pass Christian, Miss.

A Large Grapevine.

To the Editor of GARDEN AND FOREST:

Sir,—Some time ago GARDEN AND FOREST suggested that it would be of interest if observers in different sections of the country should make a note of the size of the Grapevines in their several neighborhoods. The largest one I have ever seen is growing at Rose Dhu plantation, on the May River, South Carolina. This vine, supposed to be *Vitis aestivalis*, grows on the edge of a bluff three or four feet high, at the base of a large Live Oak, and measures, at three feet from the ground, forty-eight inches in girth, and at one foot from the ground fifty-four inches in girth; this lowest portion of the stem, however, is protuberant and nodose. One of the large cable-like limbs extends out near the adjacent marsh, then dips down into the mud, in which it is somewhat buried, doubtless deriving some sustenance and growth from the salt water which laves it at every tide. Other portions of the vine clamber out and clasp the large limbs of the Oak in innumerable folds of cordage, covering the Oak from top to bottom, then extending out to and covering two other Live Oaks, one to the right and the other to the left of the central tree, the distance between which measures at least twenty paces—thus making the finest picture of a true "Forest Lao-coon" which I ever saw on the Carolina coast.

Bluffton, S. C.

J. H. Mellichamp.

Exhibitions.

Spring Flower Show in Boston.

THE exhibition of the Massachusetts Horticultural Society, held here last week was as good, at least, as any of its predecessors, and many thought it better than usual, owing to the fact that the mild weather which prevailed early in the week enabled the growers to transport their plants in fine condition. The most striking feature of the show was the Orchid exhibition, and probably its excellence was partially due to the premiums offered for the tasteful arrangement of these flowers with other plants. The difficulties of arranging a table of Orchids for effect are well known, and yet Mr. William Robinson, gardener to Mrs. F. L. Ames, did his work with excellent taste and skill. He had abundance of material to begin with, and the foliage of various Adiantums, and small Palms like *Cocos Weddelliana*, were plentifully used to bring out the colors of the flowers and give a finish to the groups. In the collection there were very many rare Orchids, and some unique ones, particularly the exquisite forms of *Odontoglossum crispum*, with well-marked flowers on long sprays. The wonderful pea-green and maroon-striped *Cypripedium Rothschildianum*, with three spikes, each bearing three flowers, was probably the most noteworthy single plant on exhibition, and it would be hard to find a better example of high cultivation. When this *Cypripedium* is seen in such admirable form as this there is little wonder that it is so much admired. A plant of *Miltonia Bleui splendens* with its two spikes, each bearing flowers four inches across, was another striking specimen, and it recalled the beautiful pictures of the plant published in GARDEN AND FOREST, vol. v. The second prize group of Orchids was from the gardens of Mr. John L. Gardner, and in the collection of Mrs. Durant, of Wellesley, was a remarkable specimen of *Dendrobium nobile*, in the cultivation

of which the gardener of the establishment, Mr. Butler, is a recognized master. This plant was grown in a fourteen-inch pan; it was nearly three feet in diameter and carried between nine hundred and a thousand flowers. It was an excellent object-lesson in the way of pruning *Dendrobiums*, since all the growths that had flowered the previous year had been cut out, leaving only those of the present year with few of last year's pseudo-bulbs, nearly all of which were bearing. Mr. Butler showed a plant similar to this two or three weeks ago, and these are two, we believe, of several that he has grown on from small plants.

Of course, there was a large display of forced bulbous plants, the best being those shown by Mr. Kenneth Finlayson, gardener of Dr. Weld, and the Bussey Institute. It is a pity that there was no full collection of *Narcissi*. Our gardens show no more attractive flowers than these, and there are numerous species and varieties, with new forms of distinct merit, appearing every year. The best *Tulips* were *Prince of Orange*, *Thomas Moore*, *Duchess of Parma*, *Kaiser Kroon*, and some of the best *Hyacinths* were *Queen of the Blues*, *Lord Derby*, *King of the Blues*, *Gigantea*, *Macaulay* and *Leviathan*. *Cyclamens* are always well shown at this exhibition, and the contest for first honors between well-known exhibitors has always been close. This year a new competitor appeared in Mr. John Barr, gardener to Mrs. B. P. Cheney, of Dover. He received the prize for the best ten plants, which, although they were not larger than those of his closest competitor, seemed to excel in color, size of flowers and neatness of habit. The *Cinerarias* made a fine display, although the efforts in the way of recent improvements with different strains have been mostly directed to the increased size of the flowers, and, to make a gain in this direction, compactness of habit has been somewhat sacrificed. These large-flowered varieties mostly bloom early, and before the plants have made a good foundation of growth, so that the relatively small-flowered plants make the best specimens. The first honors in this class went to Mr. James Carthy, of Fairhaven, who showed some magnificent specimens, although the individual flowers were somewhat lacking in size.

The forced shrubs exhibited by the Bussey Institute included *Forsythias*, *Lilacs*, *Philadelphuses*, *Spiraea Van Houttei*, several *Ericas* and *Ghent Azaleas*. The new white *Snapdragon* which Mrs. Wood, of West Newton, exhibited at the meeting of the Carnation Society a few weeks ago, was shown again; and since it has been proved that this showy biennial can be forced, it is likely to be extensively grown for decoration wherever bold displays are required.

Among the cut Roses were splendid flowers of *Paul Neyron*, *Magna Charta*, *General Jacqueminot* and other Hybrid Perpetuals, shown by David Nevins, Esq., of Framingham, Massachusetts. Mr. A. Mackay, his gardener, can be congratulated on having grown as fine Roses of this class as were ever seen in a Boston exhibition. The flowers of *Catherine Mermet*, shown by Mr. Meade, of Dorchester, were exceedingly well done, and gave a new proof that this remarkable Rose was still holding, as it has done for almost a century, a leading place among the pink Tea Roses. Its one defect, that of a loss of color on maturing, does not appear in *Bridesmaid*, which is a sport from it, and some magnificent blooms of this flower were exhibited by Mr. Frank Pierson, of Tarrytown, New York, while some flowers of another sport from *Catherine Mermet*, *The Bride*, were shown in first-rate condition by Mr. Elliot, of Brighton, Massachusetts. It is to be observed that this variety has also the defect of turning yellowish as it comes to maturity, which accounts for the fact that is yielding to some extent to the *Kaiserin Augusta Victoria*. This last Rose, however, is a hybrid Tea, and, therefore, can hardly compete with *The Bride* for all-the-year blooming.

Mr. Nicholson, of Framingham, carried off the honors for a display of Carnations, while *Storm King*, *Uncle John* and *Stuart*, all of which failed, to some extent, to meet the expectations of their friends at the meeting of the Carnation Society, were here shown in remarkably fine condition by the Cottage Gardens, Long Island.

It was a pleasure to see such a fine display of hard-wooded plants. Dr. Weld's specimen of *Acacia Drummondii*, some seven feet high, with its long pendent racemes of bright yellow flowers, made a charming picture. In the same collection was the Heath-like *Diosma capitata*, with its heads of lavender-blue flowers; *Eriostomum nerifolia*, with its star-shaped bluish white flowers; the elegant *Boronia heterophylla*, with globular pink flowers, as well as *Correae* and others. Two small plants of *Boronia megastigma*, from the gardens of Mr. John L. Gardner, filled the hall with their perfume, and from the same collection there was a magnificent standard plant of *Acacia*

pubescens, with a head six feet across, with drooping branches all tasseled with golden flowers. A young Orange-tree, which contained at once blossoms, green and ripe fruit, from N. T. Kidder's collection, was also very attractive, and *Baurea ruboides*, a handsome little shrub with pendent, pinkish, saucer-shaped flowers, from New Zealand, was new to most visitors.

Boston.

S.

Notes.

One of the very best, if not the best, of Strawberries for forcing is the old but somewhat scarce variety *Triomphe de Gand*. It will fruit abundantly in four-inch pots and it is always a sure cropper under glass.

For a week or two past the sidewalk fruit-stands have been decorated with branches of *Kalmia latifolia*, its glossy green leaves being very effective in setting off the colors of oranges, bananas and apples. Leafy twigs of Wild Cherry are largely used during the summer for the same purpose, but these Laurel leaves have only lately come into such general use. The supply comes from the coast counties of New Jersey.

A series of excellent photographs of wild flowers, made by Mr. Cornelius Van Brunt, of this city, and colored by Mrs. Van Brunt, will be used as lantern slides to illustrate a lecture on Wild Flowers in and about New York City, which Mr. Van Brunt will deliver at Hardmann Hall, on Fifth Avenue and Nineteenth Street, on Wednesday evening, April 3d. The lecture has been already given before the Torrey Botanical Society, of this city, when it was highly commended, and it is to be repeated by request.

According to a writer in the *Youth's Companion*, the largest forest in the world is in Siberia, stretching continuously from the plain of the Obi River, on the west, to the valley of the Indigirka, on the east, and embracing the great plains or river valleys of the Yenesei, Olenek, Lena and Yana, the vast belt averaging more than one thousand miles in breadth from north to south, and some three thousand miles long. The trees are mostly coniferous, and they cover thousands of square miles, whose central regions no human being has ever visited. Long-stemmed conifers, rising to a height of one hundred and fifty feet or more, stand close together, and their dense lofty tops exclude the pale arctic sunshine, and the straight trunks, all looking exactly alike, bewilder the eye in the obscurity, so that all sense of direction is lost. Even the most experienced trappers dare not venture into these forests without blazing the trees constantly with hatchets as they walk forward, for a hunter lost there rarely finds his way out, but perishes from starvation or cold.

Mr. H. G. Hubbard, the entomologist of the Department of Agriculture, writes that the cold weather which desolated the gardens and Orange-groves of Florida, killed unnumbered millions of injurious insects. All cockroaches in sight, and even those in houses, unless they were exceptionally well protected, were killed. The young scale insects which had not passed their second molt were killed, although many eggs survive, and some adults of both sexes. The nitidulid beetles in decaying fruit were also killed, small gnats in flowers were frozen, and not a living colony of plant-lice is to be seen on any Orange or other tree. No living specimen of the destructive white fly, *Aleyrodes Citri*, was found, and as the eggs are laid on the leaves, every one of which will drop before the new growth appears, the cold wave would have almost exterminated this pest but for the fact that, besides the Orange-tree, it also infests the Cape Jessamine, and as the leaves of these plants have not all fallen, Mr. Hubbard is advising the orange-growers to cut down their Jessamines and burn them. Since the breeding of injurious insects has been suspended now for some weeks an excellent opportunity has been offered to clear the trees of scale with comparatively mild insecticides. On the other hand, the trees have been so enfeebled by the cold that they will be an easier prey to injurious insects than they were before.

Dr. E. F. Franceschi writes in the Santa Barbara *Press* that the Norfolk Island Pine, *Araucaria excelsa*, thrives remarkably well in that town, some of the older specimens being already more than one hundred feet high; most of them are now bearing cones which appear to ripen perfect seeds, so that in some places there are young plants growing from self-sown seeds—that is, the tree has become practically naturalized. A Cookii, from New Caledonia, also bears cones there, while

specimens of *A. Bidwelli*, *A. Cunninghamii*, *A. Brasiliensis* and *A. imbricata* are doing well, although none of them have flowered as yet. The most remarkable exotic conifer is, perhaps, the splendid specimen of *Dammara*, which was planted more than twenty years ago on what are now the grounds of Mr. E. H. Sawyer, at Montecito. The tree has never flowered, and until it does it can hardly be identified. Dr. Franceschi hardly thinks it is the true Kauri Pine, from New Zealand, *Dammara australis*, and it has been doubtfully referred to *D. robusta*, from Queensland, while others are inclined to consider it *D. orientalis*, from Java. An apparently different species of *Dammara* with broader leaves is to be seen in *Carpinteria*. Of true exotic Pines there is a specimen of *Pinus maritima*, from the Mediterranean basin, in Santa Barbara, which is now twenty-five years old, and some fine Stone Pines, *Pinus Pinea*. The pyramidal form of the Italian Cypress, *Cupressus sempervirens*, has been much planted, and there are splendid specimens of the Weeping Cypress, *C. funebris*, from China. *Cedrus Deodara*, *C. Libani*, *Cryptomeria Japonica*, *C. elegans*, *Sciadopitys verticillata* and several other Asiatic conifers have been planted recently, and all do well. Dr. Franceschi thinks there is no other place in the United States, and, perhaps, none in the world, where such a rich and instructive pinetum could be planted, since the conifers of widely different climates seem to thrive in Santa Barbara equally well.

Every year increases the demand for grape-fruit, as people will insist upon calling the pomelo, and those who have learned to appreciate its value as a breakfast fruit in winter feel that they have something like a personal grievance when they are deprived of it. It is an expensive luxury now, however, since almost the entire supply came from Florida, and, except the limited number of boxes picked before the holidays, the entire crop was destroyed by the killing frost at the beginning of the year. Small quantities of this fruit were brought from the West Indies a few years ago, but it could hardly be given away, and no attempt has been made to cultivate it systematically on any extended scale in those islands. A week ago a few barrels were brought in from Jamaica, and they sold at auction at \$24.00 a barrel, the highest price ever realized for this fruit in New York. At retail a good pomelo costs half a dollar. As we have stated before, every orange-growing region of the world was laid under contribution as soon as the disaster to the Florida crop was known, and, therefore, the supply of this fruit is still overabundant, and oranges from Sicily can be bought here for less money than they bring in the groves where they were produced. Probably a hundred thousand dollars have been lost by the large dealers in this fruit in this city within a few weeks past. The supply of California Navel oranges, however, is now running low, and prices for fine fruit are growing more firm. The cold weather has retarded the growth of pineapples, so that the season is uncommonly late. Last week fifty-six barrels came into this port, and a year ago they were arriving at the rate of three thousand barrels a week. Of domestic fruits, pears are no longer quoted in the market reports, although in the fancy-fruit stores some of the best late winter varieties, like P. Barry, one of the long-keeping Fox seedlings, can be had at seventy-five cents a dozen. The apple supply is, of course, falling off. Ever since the middle of September this fruit has been coming into New York at the rate of about twenty thousand barrels a week. Last week, however, only six thousand arrived. Varieties, like Ben Davis, Northern Spy and Baldwins of good quality, bring at wholesale \$4.50 a barrel, while choice Spitzbergs, Winesaps and Greenings cost \$6.00. Strawberries, from Florida, have fallen to fifty cents a quart, while choice berries from farther north can only be afforded by wealthy buyers. Asparagus, from Charleston, has been in full supply, and the price has dropped to \$1.00 a bunch. Green peas sell at \$5.50 a crate. The finest salad plants in the market now are dandelion and chicory, from New Jersey, and Romaine lettuce, for which last Bermuda gardens seem to have a monopoly in this market.

Mr. William S. Kimball, of Rochester, died on the 26th of March, after a brief illness, at Virginia Beach, where he was spending the winter. Mr. Kimball has long been known as one of the most liberal patrons of horticulture in America. In Orchids, especially, he took an enthusiastic interest and was known to all dealers in rare plants of this class. He bought with intelligence, and being a man of abundant means he had amassed a collection which in its completeness and in the value of its individual plants had few rivals in the world.

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLE:—A Notable Park Project in New Jersey.....	141
A California Brook Side. (With figure.).....	142
Scotch Pine in the West.....	Professor Charles A. Keffer 142
Exhaustion of Soil by Trees.....	142
The Kerosene Attachment for Spraying Pumps. (With figures.)	Professor E. S. Goff 143
FOREIGN CORRESPONDENCE:—London Letter.....	W. Watson 144
PLANT NOTES.....	145
CULTURAL DEPARTMENT:—Seasonable Work in the Flower Garden,	
<i>Nicotiana affinis</i>	<i>J. N. Gerard</i> 146
Strawberry Leaf Curl.....	Professor Byron D. Halsted 148
Rose, Marchioness of Londonderry.....	E. O. Orpet 148
Early-flowering Perennials.....	W. P. 148
CORRESPONDENCE:—The Opening of the Fire Season in Minnesota.....	A. 148
The Cherokee Rose.....	D. F. L. 148
RECENT PUBLICATIONS	149
NOTES.....	149
ILLUSTRATIONS:—Reservoirs for water and kerosene attached to force-pumps.	
Fig. 21.....	143
Improved air-chamber of spray-pump, Fig. 22.....	143
View on Chico Creek, Butte County, California, Fig. 23.....	145

A Notable Park Project in New Jersey.

BEFORE this article is published the people of Essex County, New Jersey, will have decided at the polls whether they will approve of the law passed by the last Legislature of the state, authorizing the expenditure of \$2,500,000 for public parks, and at this writing there seems to be practically no opposition to the measure. The natural way in which this public sentiment in favor of parks has been developing for the past twenty years, until it has at last blossomed out into this actual and practical effort, is a most auspicious beginning for the enterprise, and the absence, so far, of any suspicion of self-seeking in the enterprise by any clique or any interest, is an additional encouragement to all its well-wishers. The fact that Newark city is not alone interested, but that the entire cluster of cities and towns within the large and populous county are to be united in the project, establishes a novel precedent in the history of public parks, and since Essex County has little debt the tax will be no burden, while the valuations of property facing the new parks and parkways will be sure to advance sufficiently to more than pay for the improvement.

It is fortunate that the movement has assumed this comprehensive form and that active measures are to begin at once, for not only the city of Newark, but the Oranges, Montclair and other growing towns of that region are spreading out over the country at such a pace that in a short time there will be no rural scenery left for popular recreation. Even now, although the townspeople can ride out to hills on various trolley lines for a single fare, they have little opportunity to come into contact with unspoiled nature, for their walks must be confined to the country roads. Of course, they are shut out from the woods and fields owned by private persons, and, on the other hand, the suburban residents are beginning to complain of annoyances by these throngs, especially on a bright Sunday. It is time, therefore, that some of the beautiful scenery should be set apart and devoted to public use forever. The rolling country in the northern part of the county, the equally beautiful region of wooded hills on its southern border, to the east and west of Short Hills, not to speak of the magnificent slopes of the Orange Mountain,

with its unrivaled prospect, including the harbor of New York, offer park land of the most varied and interesting character, and all accessible to a population now counted by hundreds of thousands, and increasing with marvelous rapidity.

The new Park bill authorizes the expenditure of two and a half million dollars, under the administration of five commissioners to be named by the Justice of the Supreme Court of that circuit, and they have full power to condemn land, to receive gifts, to take charge of the necessary roadways, to provide a system of maintenance, to assume control of existing parks, and, in short, to do all that is necessary in a park system in the way of construction and management. There are considerable spaces of land already held by the cities and towns which will be included in this park system, comprising old reservoir sites, lands taken for taxes, ancient commons, gores of land at intersecting highways, and the money authorized will suffice to secure land for three or four large parks in different parts of the county—one, perhaps, on the Orange Mountain, one near the flat Newark meadows, where there is a large factory population, one on the rolling lands west of the Passaic about Belleville and Franklin, and another still to the south, perhaps in the vicinity of Waverly, where the land is also rolling and where there is some water. In addition to the greater park areas and the smaller parcels of lands already possessed, the funds will suffice to secure connecting ways, playgrounds and all the open spaces actually needed, and, besides this, it is believed that many public-spirited citizens will make donations of land where it can be used to round out and complete the park system.

If we were asked to make a suggestion to the commissioners whom Judge Depue is to appoint, we should say that since these parks are situated in different parts of the county, and each one is surrounded by a population with distinct characteristics, the sites should be chosen not only to meet special needs in each case, but they ought to be selected as component parts of one comprehensive plan, so that each one shall be a complement to all the rest and furnish attractive features not offered by the others. Besides this, the usefulness of these parks would be greatly enhanced if broad roadways could be secured to connect them with each other and with what are to-day different cities, but which will be within a few decades different sections of one great city. In this way the practical park area will be largely increased, and the property along these parkways will be greatly enhanced in value, for the most inviting place of residence in the county will be found along their lines.

And this leads to another suggestion, which is, after all, the one of prime importance. Any park will lose half its value, and often more than half its value, unless it is prepared by a skilled designer. No man would think of erecting a building worth two millions and a half without employing the best architect who could be secured, and the parks of Essex County will cost much more than that amount before they are completed. Therefore, a skilled landscape-architect—an artist who has demonstrated his ability to cope with all the problems presented in a work of such magnitude as this—is essential. Moreover, the time to call him into consultation is before the ground is bought. It is a well-known fact that has been proved over and over again in the history of parks in all the great cities of the world, that if the designer is called in after the land is bought, he finds certain approaches and modifications of boundaries necessary, and the cost of what is needed afterwards to finish out the whole into a perfect picture is often nearly as much as the cost of the original land, because of the suddenly enhanced value of the property adjoining the site. After Central Park was bought and the plan was made, it took nearly half a million dollars to buy the small square at Fifth Avenue and Fifty-ninth Street, known as the Plaza, which was needed as a vestibule to give the great pleasure-ground some dignity of approach and entrance. The proper way, therefore, is to invite the trained park maker

to advise in the selection of the ground and in fixing its boundaries. It is very plain that these boundaries can be much more intelligently laid when something like a general scheme has been decided upon by the designer. It will cost less money, it will be a safeguard against expensive and ruinous mistakes, and it will enable the city to acquire priceless possessions that otherwise will be lost forever.

Very rarely has a community had so splendid an opportunity for a series of pleasure-grounds. Their design should be entrusted to no one who does not stand in the very front rank of his profession. Let us hope that Essex County will prove herself equal to the occasion.

A California Brook Side.

CALIFORNIA has such a wide variety of soils and climates that its experiment stations are properly distributed about the state, and when the system is complete, one who visits the main outlying stations in succession will traverse a road which varies in altitude from the sea-level to 8,000 feet above it, and make a journey of 3,000 miles before he finishes the circuit. The Chico Forestry Station is in Butte County, in the upper Sacramento valley, and beautifully situated south of Chico Creek. The work there has already been described by our correspondent, Mr. Shinn, and that much of the land hereabout is favorable to tree growth is evidenced by the fact that the famous Hooker Oak, on the grounds of General Bidwell, which was illustrated and described in *GARDEN AND FOREST*, vol. iii., page 606, is only a mile from the station. The illustration on page 145, from a photograph sent by Mr. Shinn, is given to show a characteristic bit of scenery in this neighborhood, the view being taken from a point on Chico Creek. Except in the higher mountains of California, there is usually a less shrubby undergrowth along the brooks than there is in the eastern states, and they are, therefore, less attractive. What strikes the eastern visitor most is the fact that the Alders which often line their banks are large trees instead of shrubs, as they are here, and that our low-growing Willows are also replaced by trees of considerable size. The principal trees in this picture are the Plane-trees or Sycamores, *Platanus racemosa*, which the early botanical explorers confounded with our Sycamore, *Platanus occidentalis*, until it was distinguished by Nuttall in 1835. The tree sometimes reaches one hundred and twenty feet in height, with a trunk as much as nine feet in diameter above its broad tapering base, often free of branches for half its height, but more frequently dividing into several secondary stems near the ground, reclining or prostrate for twenty or thirty feet after they separate. The branches of these trees are long, spreading and contorted, making an open round-topped, though irregular, head. It is found in the valleys and along the banks of streams, and is one of the noblest deciduous-leaved trees on the Pacific coast.

Scotch Pine in the West.

OF the various conifers easily obtainable in the commercial nurseries, the Scotch Pine, *Pinus sylvestris*, has succeeded over a wider area than any other, with the exception of the Red Cedar. It seems to do equally well in Dakota and Kansas, and one of the best wind-breaks that I have seen is made of Scotch and Austrian Pines at Ainsworth, Nebraska, near the one-hundredth meridian, on high dry prairie. These Pines were two years old when planted, nine years ago, and they are now from twelve to eighteen feet high, and average eighteen inches in circumference two feet from the ground. Armstrong is ten miles south of the Niobrara River, and the soil is the usual clay loam of the plains. Notwithstanding the unprecedented drought of last year these Pines made a fair growth and were stocky and vigorous when examined in October.

In the spring of 1888, five hundred Scotch Pines, from

eight to fifteen inches high, were received at the South Dakota Agricultural College. The trees were set in nursery rows, cultivated and mulched, and eighty-six per cent. of them grew, the average growth for the season being four inches. The following spring these trees were set in mixed plantation with Silver Maple, Birch and Cottonwood. The transplanting was carefully done, but a poor stand resulted. In October, 1894, the Pines averaged four feet high, the tallest being eight feet nine inches. The average growth for the past dry year was eleven inches. This illustrates very well the action of the Scotch Pine throughout the west. As with most other conifers, it is difficult for it to become established, but once a stand is secured there is no further difficulty.

There are a number of fine Scotch Pines at Arbor Lodge, the home of the Secretary of Agriculture at Nebraska City, Nebraska. One of these measured thirty-two feet in height and five feet in girth, breast-high. Standing in the open it had branched freely near the ground, making a broad spreading crown. At Franklin, in Nebraska, the south tier of counties and near the ninety-ninth meridian west, the Scotch Pine is vigorous, and trees ten years from the seed measured twelve feet high. A tree that had been planted in prairie sod when two feet high, ten years ago, measured fifteen and one-half feet high. It is impossible to imagine a condition of greater drought than prevailed at Franklin last year. When seen in October the land showed no trace of moisture, even in the fields.

Scotch Pine was tried in an experimental planting in the Sand Hills of central Nebraska, but only a few trees lived, but these did not equal the Banksian Pine in growth. The soil of the region is nearly pure sand, raised in high ridges and almost devoid of vegetation, only a few species of the hardiest plants growing on it.

Fine young specimens of Scotch Pine were seen in the suburbs of Denver, where all trees are irrigated. In the rich sandy loam of the Smoky Hill River, at Salina, Kansas, the Scotch Pine flourishes, many large trees growing in the lawns of that pretty prairie town. At Ogallah, on the high dry plains of western Kansas, one Scotch Pine, planted several years ago in the unbroken prairie sod, is growing slowly, but is evidently in perfect health. At the Kansas Agricultural College, Manhattan, the Scotch Pine has not succeeded as well as the Austrian Pine in close plantation. It has grown taller, but does not look as vigorous. However, the comparison is hardly fair, as there are many more Austrian than Scotch Pines in the plat, and the latter are more closely planted.

It is safe to assume that, once the trees have survived their first year in their prairie home, no conifer that has thus far been largely tested gives better results in the west than the Scotch Pine.

Washington, D. C.

Charles A. Keffer.

Exhaustion of Soil by Trees.

A CORRESPONDENT of *The Country Gentleman* writes as to the comparative exhausting power of different kinds of forest-trees upon the soils where they have grown. He had heard that the Pine-barrens are so called because Pine woods made land barren and that certain native species are poison to land. The letter was referred to Mr. B. E. Fernow, chief of the Forestry Division of the Department of Agriculture, and we quote the main points in his reply :

As far as exhaustion of minerals from the soil is concerned, no fear need be entertained, since forest-trees require only the smallest quantity of the commoner kinds of minerals from the soil, and in addition they return the bulk of these to the soil in a more soluble form by the fall of leaves and twigs; hence they improve the top soil, as is well known. The foliage of some trees decomposes more readily than that of others, and forming a humus of more or less desirable composition, this beneficial effect varies with the species; thus, while the conifers, especially Larch and Spruce, as well as the Beech, are among the greatest improvers of soils, the humus from Catalpas, Black Locust, etc., is of little use, while the foliage of the

Oaks decays but slowly, and hence does less for the improvement of the soil. But the saying that "Red Oak and Black Walnut poison the soil" is probably an overstatement—at least, we have no knowledge that this is really so or any reason to believe it; they are simply less useful in making humus.

Of much more moment to tree-life than the minerals, is the water of the soil, and in respect to the amount of water transpired, trees differ very widely, so that, in general, deciduous-leaved trees may transpire six times as much as coniferous trees. The Pines especially are moderate users of water. These latter are satisfied with such small amounts, that they can occupy the dry sands of the Pine-barrens to the exclusion of other species.

The deterioration of soil under given trees, then, depends upon the rapid exhaustion of the soil moisture. This exhaustion is, however, much less due to the transpiration by the trees themselves, than to the surface evaporation, and this again is dependent upon the amount of shade which the trees exert. Under a dense growth of the shady Beech, Hemlock, Spruce, Sugar Maple, etc., no exhaustion of moisture takes place, while under the light-foliaged Birch or Oak, especially in later life when the crowns become thinned out, the sun reaches the soil readily and much water is evaporated. In addition, if these trees stand alone in a field, the raindrops readily fall through the foliage upon the soil and compact it; thus much less water can percolate and the evaporation from the compacted soil is increased, as every farmer will understand who cultivates his crop in order to reduce evaporation.

As far as influence upon neighboring crops is concerned, trees exert a deleterious influence upon the immediately adjoining portions either by their shade—and some species are shadier than others, hence a difference in degree of effect—or by their competition for moisture. Some kinds, like Cottonwoods, Willows and Elms, require not only more water than others, but their root systems are capable of rapid and enormous extension in search of water, so that their influence is far-reaching. Grape-vines are of the same nature, so that it is almost useless to cultivate in the neighborhood of a vineyard, unless the soil contains a superabundance of moisture.

The taproot trees are less injurious, because they supply themselves from greater depths, while the shallow-rooted ones, like Black Locust, Beech, Spruce, etc., compete on the same level with the annual crops.

The Kerosene Attachment for Spraying Pumps.

IN a brief report of a meeting of the Association of Economic Entomologists, in the last volume of GARDEN AND FOREST, page 480, mention is made of the implement devised by me, by means of which kerosene is mixed with water at the instant it passes through a spraying nozzle, so as to obviate the need of making an emulsion previously. The machine was arranged so that the piston draws on both the water and the kerosene supply at once and mingles the two fluids in correct proportions. Mr. Marlatt, of the Department of Agriculture, stated that the practical working of the machine with him had rendered any application of the oil dangerous to plants, since it was impossible to foretell the percentage of each substance used. In my own work with this attachment every trial but one was satisfactory so far as the destruction of the insects was concerned, nor was there any case where the foliage was injured except in one instance where fifteen per cent. of kerosene was purposely used on the Raspberry. Mr. Marlatt's work, however, has led me to make a more careful study of the apparatus, and I offer here a report of my experiments:

I find that there are two reasons why the apparatus I have used is liable to throw variable quantities of kerosene. The varying level of the two liquids is one, and the fact that the air-chambers of the pump is located directly above the discharge-pipe is another. The first is liable to cause inequality by varying the heights to which the two liquids are lifted; the second by permitting the kerosene to accumulate in the portion of the pump-chamber located above the discharge-pipe,

and this accumulation is forced down and out whenever the pressure in the chamber is relaxed. Both of these inequalities are, however, capable of easy remedy by changing the form of the reservoir to hold the liquids, and by altering the relative position of the air-chamber and discharge-pipe of the pump.

For the water reservoir, I used a five-gallon tin can, to which were attached three legs near the top (as shown in figure 21), on which it can stand securely in an inverted position. Then a tin basin was attached to these legs at such a position that when the can is inverted the bottom of the basin hangs an inch and a half beneath the mouth of the can. In the drawing (see fig. 21) the front side of this basin is represented as being cut away to show the mouth of the can. In the centre of the bottom of this basin is soldered a neck to which a screw-cap is fitted. Through this neck the tube of a funnel can be passed, so that it will enter the mouth of the can for filling.

Near the top of this can (or near the bottom when in its inverted position) is soldered a staple of heavy tin, to which is attached, by means of a hook, a one-gallon can, with a basin suspended beneath its mouth, as in the larger can, the smaller can being used for kerosene. The kerosene can is hung at such a point that its mouth is on a level with that of the larger can. This arrangement maintains the two liquids at practically uniform levels. The suction pipes are placed in the basins, and the liquids are supplied from the cans as fast as they are drawn out.

The change made in the pump will readily appear in fig. 22, which is intended to show the air-chamber of the Climax pump. The discharge was originally at A, and the part of the chamber above this orifice answered as the air-chamber. I attached the discharge at B, and extemporized an air chamber at A by uniting sections and fittings of gas-pipe. With this arrangement there is no opportunity for the kerosene to accumulate by separation above the discharge-pipe. Should a very little accumulate in the air-chamber, it is not likely to be forced back until after the pumping has ceased.

With this arrangement of the pump and the reservoirs I have secured excellent duplicates in the proportions of kerosene distributed at different times. In these trials a Nixon nozzle, with a fine orifice diaphragm and medium gauze, was used, and a second diaphragm with a fine orifice was added at the union of the hose with the pump, which I find increases the intimacy of the mixture. The stream was permitted to flow for a moment after starting the pump, after which it was directed into graduated glass cylinders of 500 cc. capacity, and three cylinders were filled in each trial, sometimes in immediate succession, and sometimes the spray was directed elsewhere for a time after filling one before it was turned into the next. After the cylinders were filled they were permitted to stand for a few hours for the kerosene to separate from the water. The test was repeated on several different days, and with the cock in the kerosene tube set to throw quantities of kerosene varying from two to twenty per cent. For some unexplained reason, the proportion of kerosene would increase a little until a few strokes had been made on the pump, but after this it remained almost entirely constant, rarely varying more than two or three tenths of one per cent. in the different cylinders in the same trial.

These results are certainly sufficient to show that the difficulties experienced by Mr. Marlatt were due to defective mechanical arrangement, and not to a defective principle.

The cans used in my experiments are not expensive, and if well cared for when not in use should last many years. With a properly constructed pump, and with the exercise of as much care as is necessary in the use of the Bordeaux or Paris green mixture, the apparatus used in my former experiments will give satisfactory results, so far as destroying insects without harm to foliage is concerned. Still I shall hereafter employ the cans, since they insure a uniform distribution of the kerosene. The saving in the cost of the soap over using the kerosene-soap emulsion will soon amount to the cost of the cans, and no one who has tried the mechanical method of combining kerosene and water will dispute the great saving of labor effected by it, as compared with the kerosene emulsion.

Experiment Station, Madison, Wis.

E. S. Goff.

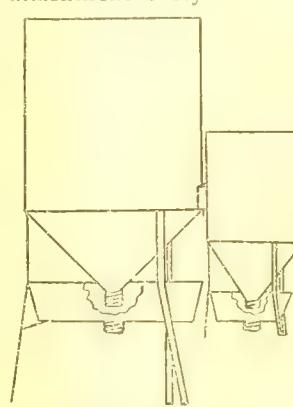


Fig. 21.—Reservoirs for Water and Kerosene attached to force-pumps.

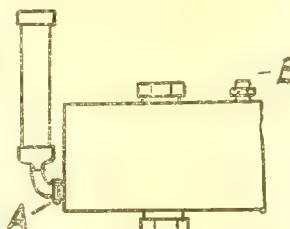


Fig. 22.—Improved air-chamber of spray-pump.

Foreign Correspondence.

London Letter.

Cœlogyne Micholitzii.—A large number of newly imported plants thus named were sold here by auction this week at the instance of Messrs. F. Sander & Co., with the descriptive statement that this *Cœlogyne* was discovered by, and named after their collector, Mr. W. Micholitz, who writes that he has one flower-stalk twenty-seven inches long, which has borne seventeen flowers. The dried flowers are described as of large size, pure white and of great substance. In pseudo-bulb, foliage and flower-scape this plant bears a close resemblance to *C. barbata*, but it appears to be larger in all its parts. It belongs to the section of the genus named *Proliferae* by Dr. Lindley, by reason of "a second scaly sheath being often produced beyond the first series of flowers, and out of that sheath arises a second series of flowers." The plants were in good health, and good pieces brought five guineas each.

Dendrobium Apollo is the largest and handsomest of all the hybrids bred from *D. nobile*. Its parents were *D. Ainsworthii* *splendidum* and *D. nobile pulcherrimum*, and it was raised by Messrs. Cypher & Son, of Cheltenham, perhaps the most successful growers of *Dendrobiums* in England. A plant of it in flower was exhibited by them last week. It has the habit of a strong *D. nobile*, and flowers like those of *D. Ainsworthii*, but the segments are broader and longer, the spread of the flower being fully three inches, while the color is like *D. Ainsworthii*, but darker in the labellum. This is a plant to be looked after, a truly noble Orchid. No doubt, Messrs. Cypher intend to propagate it as rapidly as possible, and as all the *D. nobile* hybrids are easy to cultivate, and may be propagated from pieces of pseudo-bulb, we ought not to have to wait long for an adequate supply of the well-named *D. Apollo*.

Masdevallia Melanoxantha.—This is an interesting species, of which an example in flower was exhibited last week by Messrs. F. Sander & Co. It is the true plant as described by Reichenbach some twenty years ago, and not *Masdevallia Mooreana*, which, however, often does duty for it in gardens, although the two are widely different. A figure of the latter may be seen in the *Botanical Magazine*, t. 7015, and one of *M. melanoxantha*, the first published, is given in *The Gardeners' Chronicle* for this week (page 359). It has fleshy spoon-shaped leaves, like those of *M. Harryana*, and erect single-flowered scapes, the flowers being remarkable for their flat black-purple lower sepals, which are united almost to the apex, forming a bilobed body an inch wide and an inch and a half long. The upper sepal is rigid, narrow, at right angles to the lower, and concave at the base. The labellum is hairy. It is quite distinct from all other cultivated *Masdevallias*, and in attractiveness would rank among the second-rate species.

Phaius Amabilis is a worthy companion to *P. Cooksoni*; indeed, the two might with some reason be called forms of one. The principal difference is in color, the former having flowers of a pale pink color and a dull crimson lip covered with reticulating lines of greenish rose, the outside color being coppery red. It was raised by Messrs. F. Sander & Co. from *P. grandifolius* and *P. tuberculosus*, and was awarded a first-class certificate two years ago. There is a good number of plants of it in the St. Albans nurseries, from whence a group of flowering examples were shown last week along with fine flowering specimens of *P. Cooksoni* and *P. Marthiae*. These hybrids are specially valuable, as they have inherited much of the floral beauty of *P. tuberculosus*, and, at the same time, are as robust in growth and as easy to cultivate as *P. grandifolius*, which in tropical countries is used as a bedding-plant. I have seen good specimens of it grown in river mud, and magnificent plants of it have been grown in the same soil as and treated with garden Crotons.

Maxillaria Sanguinea.—This species was first introduced about four years ago from Chiriqui, and it has since flowered at Kew and elsewhere. A description of it was lately

published in the *Kew Bulletin*, and Messrs. F. Sander exhibited it in flower last week. It belongs to the same group as *Maxillaria tenuifolia*, having a slender rhizome, small ovate pseudo-bulbs an inch long, and grassy dark green leaves about a foot long. Flowers singly on short erect peduncles, an inch across, the sepals and petals brown, the lip crimson, with a few small dark brown spots about the crest and a pale-colored margin. It belongs to the modest wee things among cultivated Orchids, and is quite worth including in good collections.

Gladiolus trichonemifolius is a pretty little species of the same section as *G. tristes* and *G. cuspidatus*, which are characterized by small corms and rush-like or suberete foliage. The first named is now nicely in flower at Kew, corms of it having been obtained from the Botanic Garden at Cape Town, an establishment which now trades in rare bulbous and other plants native of that region. There is a poor figure of this *Gladiolus* in an early volume of the *Botanical Magazine*, compared with which the flowers on the plants now at Kew are much larger and of a softer canary-yellow color. They are borne on slender stems a foot high, and they have almost equal oblong segments spreading to a diameter of two and a half inches. As Mr. Baker says, this species is quite distinct from the other members of the genus in having so regular a perianth, a character which led to Solander classing it with *Ixiolirion*. Another name for it is *G. citrinus*. A dozen corms in a six-inch pot make a pretty little specimen when in flower at this time of year.

Sternbergia Fischeriana.—This plant has been introduced into England in quantity by Mr. E. Whittall, of Smyrna, some of whose bulbs are now in flower in pots and in the open border at Kew. It differs from the other species in cultivation in its habit of flowering in spring, and as the flowers are as large as the largest form of *Sternbergia lutea* and of a brighter yellow color, it is likely to prove a useful plant for the spring garden. There are three or four flowers on each bulb at Kew, and the flowers each last a week or more. The species is mentioned by Herbert in his *Amaryllidaceæ*, but he knew it only from a poor dried specimen. Mr. Baker does not appear to have seen good specimens of it before he published his book on Amaryllids. We have now three good garden *Sternbergias*, namely, *S. lutea*, a common plant in south Europe and northern Asia, which Clusius called the autumn-flowering *Narcissus*; *S. macrocarpa*, described by me in the last volume of *GARDEN AND FOREST* as having flowered at Kew from bulbs obtained from Mr. Whittall. This is a superb plant, as will be seen presently from the figure of it shortly to be published in the *Botanical Magazine*. Its flowers are nearly six inches across when wide open under the influence of bright sunlight, and they are of a bright golden-yellow color. The leaves are suberete, glaucous and very similar to those of the common Daffodil. The third is this spring-flowering species.

Snowdrops.—These are beautiful now on our lawns, among the rockery plants and along with the hardy Ferns. Many thousands of bulbs of *Galanthus Elwesii* were dibbled into the ground last October, and as soon as the thaw came to release them they sprang up quickly everywhere. I think they are most effective among the hardy Ferns, the rich brown of the dead fronds as they rest on the ground being a pleasing contrast to the pure white of the Snowdrops. Fadists who believe in making a species of every plant which deviates slightly from a given type would have no difficulty in finding at least a dozen among these thousands of *G. Elwesii*. One form in particular is worth notice, its leaves being glaucous and quite an inch wide, while its flowers have outer segments an inch wide and an inch and a half long. Of course, it is only a major form of *G. Elwesii*. Indeed, there are some who hold that this latter is nothing more than a form of *G. plicatus*. However, "let him name it who can, its beauty will be the same." Snowdrops are so cheap and they have so great a charm in the early spring, when largely planted on lawns, etc., that

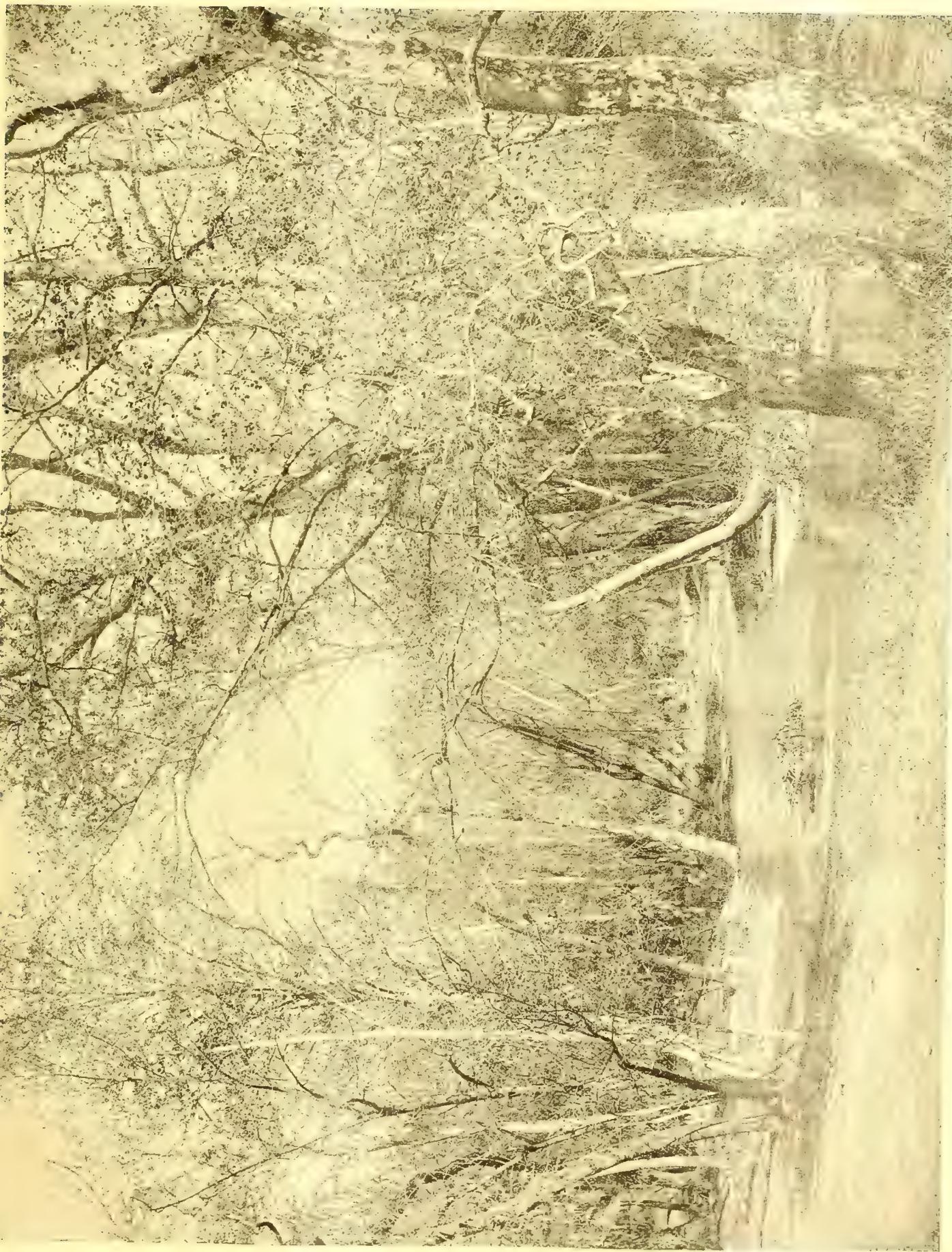


Fig. 23.—View on Chico Creek, Butte County, California.—See page 142.

every good garden should contain them in abundance. Even if they die after flowering every year, they are worth the little outlay in money and labor to renew them each autumn. The same is true of yellow Crocus and blue Chionodoxa, which are as largely employed and are quite as effective here as the Snowdrops. In some gardens these plants will establish themselves and multiply from seeds and offsets, but as a rule they fail to do this. The common yellow Daffodil behaves in the same manner. At Kew it will not live long if left to itself, whereas in some gardens known to me it is as independent of the gardener as the Dandelion.

London.

W. Watson.

Plant Notes.

AZALEA INDICA.—This old and well-known plant is now sold as a pot plant in such large quantities at this season of the year that it may be well to call attention to the fact that it has other uses than for Easter decoration. Indeed, there is nothing in the whole list of greenhouse plants more serviceable, more easily grown or more satisfactory. It is nearly hardy and can be safely and cheaply stored in a cold pit from which the frost is barely excluded; thus making it possible, without trouble or much expense, to hold in reserve a stock of plants which may be brought into bloom at any time from December to June, an important matter in greenhouse economy. Most of the plants now on sale are imported from Holland and Belgium; they are carefully trimmed and present a most symmetrical appearance; it is not at all necessary, as is generally the custom, to bestow so much labor and care in preserving these formal figures. The plant is thoroughly good if allowed to grow naturally; wire frames and numerous ties can be dispensed with. There is a method of growing them not generally practiced which simplifies, in a marked degree, the difficulties of handling Azaleas. They are planted out in a bright, sunny border early in May; the soil should be deep, well trenched and full of well-rotted manure; plenty of water should be given all summer—much the same sort of care one would give Carnations, Chrysanthemums or Violets in field-culture. A most vigorous growth will be the result of this treatment, astonishing to one who knows only the ordinary increase in pot-grown plants. If any one shoot obtains an ascendancy it must be pinched in; if suckers appear at the base, particularly in grafted plants, they must be removed, but staking in any form or tying is almost wholly unnecessary. In the autumn, late in August or early in September, they are lifted carefully and potted; they should be kept close for a few days and rather warm, after which they may stand in the open air until the nights are too cold, when they should be stored in pits and brought into the greenhouse in successive lots through the winter and spring. The result is not the formal type with which we are so familiar at exhibitions and in choice collections; but it is a healthy plant which looks like an Azalea and nothing else; the foliage is better, larger and deeper green, the flowers are quite as numerous and apparently of better size and texture. These Azaleas are good house plants; if the living-rooms are not too hot they will keep in flower for several weeks; care must be given to watering—if once they become dry it is difficult to restore them; if they can be kept in a cool room, an attic or bedchamber, before and after blooming, they will continue in good condition for years. It is unfortunate that the varieties now offered are largely double or semi-double; much of the grace of the flower is lost in their malformed petals; it is not sufficient compensation that they last a little longer.

MARICA CÆRULEA.—This Iridaceous plant from tropical South America is well worthy of cultivation, though the flowers, as implied by the generic name, are quite fugacious. The plant appears as a flat-clustered mass of sword-shaped leaves from an inch to an inch and a half in width and four feet or more high. The stems on which the flowers are borne at this season are of the same shape, and as

wide as the leaves, with a central vein. The flowers are borne from the side of this vein, near the top, on a small expanding stem, and appear in succession. They most strikingly resemble Tigridias in shape, with flat petals of bright lilac, and a depressed bowl, which is lined and striped with brown. This Marica grows well, and flowers regularly in a temperate house.

IRIS ROSENBACHIANA.—This Bokharan plant flowers with the Irises of the Reticulata section, although it is much larger and more showy. Its blooms are the most striking and distinct of the early Irises, and are variable both in size and color, red and blue purples and yellow being the prevailing ones. A very good form, sent to this office by Mr. Gerard, has falls of deep velvety red-purple, shading to a lighter tone of same on the claw, which is striped in two lines of dark color on each side of the bright orange-yellow ridge, which extends to the base. The crests are of an intermediate shade of purple, fading out on the styles, which are white beneath. The standards are small, spoon-shaped, and extend horizontally. The falls are slightly wider than the claws, but appear narrower, as they are partly folded usually. The claws and styles make a long tunnel, and Mr. Gerard observes that the bees, which are now active, have some difficulty in finding the nectar. They are deceived apparently by the open shape of the flower, and search around the base of the styles, neglecting the signals, which point the true way. This Iris belongs to the Juno section, with *Iris Persica*, etc.; and has a white-coated bulb with curious ovoid short roots, which would seem to be inverted offsets. The flowers appear in succession, usually two or three from each bulb, before the leaves. The leaves appear too late to be damaged by the frost, unlike others of the section, such as *I. orchiooides* and *I. Caucasicus*, and yet the more forward foliage of these plants usually suffers little, if at all.

HYACINTHUS CILIATUS (MUSCARI AZUREUM).—This deserves high rank among the earliest spring-blooming bulbs. B. M. Watson, Jr., of the Bussey Institution of Harvard University, writes that it was well in bloom during the last week of March in a bed planted with Crocus, Snowdrops, Iris reticulata, Bulbocodium vernum and many varieties of Squills and Chionodoxa; the Crocus Cloth of Gold, Bulbocodium vernum and the Snowdrops were its only companions in braving the cold winds and frosty nights of the season. Grape Hyacinth has been received for several years past from Van Tubengen, Haarlem, but it does not seem to be described by any of the gardening authorities on bulbous plants, nor is it generally offered in the trade lists. It resembles in its general habits of growth and flower the well-known *Muscaria botryoides*; the principal difference is that it blooms fully four weeks earlier and the flowers are much lighter in color, a beautiful robin's-egg blue. It is perfectly hardy and robust. Altogether it is a decided acquisition to our few very early blooming plants, and should be more frequently used.

Cultural Department.

Seasonable Work in the Flower Garden.

AFTER the severity of the past winter, there is not much doubt as to how to prune the hardy Roses, for with us they are killed down to the snow-level, and some lower still, but this has happened before, and the summer crop of bloom has not been much affected in the majority of kinds. Some of the weaker growers are sure to die out after hard winters, and this goes to prove that there are but few really reliable hardy Roses that can be planted in those parts of New England where arctic weather may be expected. A good coat of snow is the best protection, and if this is absent we always put straw round the roots, so that the plants may not be killed to the ground. It is best to cut off all dead wood as soon as possible before the sap begins to move and the buds to swell, pruning off at the same time all weak and useless wood that would not flower the coming season. We like to put on a sprinkling of some good commercial fertilizer and lightly dig it in after the beds are raked over; it helps to give the young buds a good start, and brings fine Roses later as well as good wood for next

year. We find it better to fertilize in spring than later in the season, for later applications have a tendency to produce fall growth that does not mature well, and often gets killed by frost. Besides this, the soluble parts of the chemicals, if applied late in the season, will leach out and wash away after growth is over, while if put on in spring we get its full value in the growth of the plants. Barnyard manures are good for new plantings of Roses, and would be good as a mulch all summer, but where it must be dug in to hide it, we prefer the commercial fertilizers, and avoid disturbing the roots of the Roses as much as possible.

Flowering shrubs need attention at this time; some need pruning back hard, like *Hydrangea paniculata*, to get good results. We find that this is one of the few shrubs that must be pruned back to a certain distance every year and all weak shoots cut out, and then strong flower-shoots come away; even these are sometimes reduced when too numerous. Nearly all flowering shrubs, however, are best not cut back in this way, or we sacrifice the growth that is to flower later. It is better to prune after the flowering period, if necessary, in all shrubs that flower in early summer. It is painful to see so often in suburban gardens, where the hired man has been round with the knife and reduced all the deciduous shrubs to a regular, or irregular, shape, regardless of the nature of the subject or of the possibilities as to bloom later. *Deutzias*, *Syringas*, *Pyrus*, *Wiegelia*, *Chionanthus* and *Rhus cotinus* are served alike, and the owners go on expecting some day to see a beautiful flowering shrub such as they see in the lists of tree agents.

One of the first things to attend to in spring is to reduce within reasonable limits such perennial plants as have a habit of taking up more room than is allotted to them. There are many good plants that offend in this way, and would soon overrun the garden if left a year or two. *Helianthus rigidus*, *Monarda didyma*, *Achillea serrata* and its variety, the Pearl; some of the *Spiræas*, as *S. lobata* and *S. palmata*; most of the perennial *Asters* and *Golden-rods*, *Boltonias*, and some of the *Coreopsis*, such as *C. tripteris* and *C. verticillata*—these, and many others which reproduce themselves too freely from seed, must be taken out remorselessly, or other plants of more value will be choked out before the summer is over, and too late to remedy the matter. We have often lost rare plants, not so much on account of their inherent weakness as because of the vigor of their companions. It is the old story over again, simply the survival of the stoutest.

As soon as the soil is in a fit condition to work freely the Pansies will be planted out in the flower garden, and in the mean time they are being kept as cool as possible to prevent the too early bloom that sometimes comes in the frames. The first crop is always the best, and we like to have this in the open ground, and to this end we cover our Pansies in fall with shutters and not sash, no leaves or straw is necessary, for this makes a fine harbor for mice, and when these shutters are taken off at the end of March the plants are in the best order to transplant in the middle of April, and will stand all the cold we get after this time. Last year we had snow on them for several days in the beds, but it did not hurt them a particle. We like to plant Pansies along the margin of the Rose beds; they do well in this rich soil where it is cool and moist; they are past about the time the Roses need to be cleaned up after flowering, and can then be cleared away. We have also a bed of Pansies by themselves each season, and too much cannot be said of these beautiful strains that are now offered at such reasonable rates, more especially those strains that are of French origin, Bugnots and Cassiers, and those known as the Parisian and Trimardeau are the highest development to which the Pansy need be brought.

South Lancaster, Mass.

E. O. Orpet.

THE work of cleaning up the flower garden after a long winter requires a good deal of care, and only experienced persons should be intrusted with the work. The customary practice of digging over the borders is a bad one, for, no matter how careful we may be, many plants just starting into growth will be injured. To put a spade or a fork into a clump of *Narcissus* and lift it partly out of the ground, as is often done, before it is seen, does incalculable harm, as growth with these, and all spring-flowering bulbs, commences in early autumn. Roots destroyed now will not be renewed this season. So it is with *Pæonies*, *Delphiniums* and all other plants not directly in sight. We find it better to put a mulch on in the autumn, and clear only the loose litter off in spring, breaking the soil only in places where renewals are to be made. A general overhauling, a replanting, and dividing of clumps which have grown too large, every three or four years will be often enough.

A few days ago I was sorry to see a lot of *Spiræa Thunbergii* and *S. Van Houttei* clipped "into shape." All flowering wood was cut away. Treated thus, I tried to think what splendid hedge-plants they would make. Those who can get over the idea of mutilation should give them a trial. No spring-flowering shrubs should be pruned in spring-time more than to cut out dead or weak shoots, or any that mar their graceful symmetry of form. Bushes of *Rosa rugosa* getting too tall, as they will when in masses, might be cut back. These will fill up the breaks quickly, and flower well by the autumn, but it is hard to make up one's mind to do this with such a charming and deliciously scented Rose, especially as it blooms so early.

We find sound wood of *Clematis paniculata* from ten to twelve feet above the ground, but consider it better to trim it back to within six feet. We also cut out weak shoots, and leave only a spread of the strongest. As it is a rapid-growing climber, it quickly covers a large space, and we have the trellis uniformly covered, where we would have only a congestion of growth at the top if it was left unpruned. Last season we worked in three or four pounds of commercial fertilizer about four feet away from the plants, and were rewarded by the most luxuriant growth ever made. One plant covered over three hundred square feet, and grew to the height of fifteen feet. When pruning the Chinese Wistaria, after it has made all the growth needed, we should select for cutting the long whitish spinous growths, and leave the shorter-jointed, darker-colored wood, which only produce flowers. It is important to make this distinction between ordinary running growths and flowering wood, as many amateurs make the mistake of cutting the latter out. Autumn-flowering shrubs generally bloom on the current year's growth, and may be safely pruned back if getting out of shape or straggly, as will happen in the case of the Rose of Sharon, *Hibiscus Syriacus*. *Hydrangea paniculata grandiflora* is another well-known shrub which can be cut back in spring to within two or three eyes of the old wood.

It is too early yet to overhaul the rock garden, but as soon as possible we shall clear up all dead matter and top-dress with a mixture of loam and lawn fertilizer. We use this in preference to common barnyard manure, which is usually full of weed seeds. Some plants will be dead, and against such a misfortune we make a sowing of new or selected kinds every year. Now is a good time to sow seeds of perennials and hardy annuals. Cold frames are best suited for this purpose. They are to be preferred to outside culture for the majority of kinds. Better attention is given in the matter of watering and shading when we have them under our eyes, so to speak. Sweet Peas ought to be sown as soon as the ground can be worked. It is not open here yet. Trenches such as we use for Celery do very well. This gives us a good chance to water thoroughly during dry weather. No plants suffer more from drought and more quickly go out of bloom if neglected. *Gladiolus*, *Crocosmias*, *Tritonias*, *Millas*, *Galtonias*, *Amaryllis* and other summer-flowering bulbs should be planted as early as possible, and the sooner hardy plants of all kinds are put out the better, so as to get them well established before the dry hot weather comes.

Wellesley, Mass.

T. D. Hatfield.

Nicotiana affinis.

NICOTIANA AFFINIS is a hardy annual now well known in gardens. It grows very vigorously in ordinary soil, attaining a height of three or four feet, and has strong thick roots. It produces rather thin dark green leaves, which decrease in size from the base upward. It produces in abundance tall flowering stems with numerous flowers borne on these at intervals of several inches. These flowers have long narrow tubes with spreading five-lobed corollas. The three upper lobes are crimped backward to the tubes, giving a unique character to the bloom, which is pure white, with a tinge of light green in the tube. Once grown in the garden it usually propagates itself by self-sown seeds, and these furnish often young plants in the late year, which will survive moderate winters. The most annoying limitation of *N. affinis* is that in the borders in summer the flowers open in the late afternoon and close in the morning, and the plants in midday are not attractive. Lately I have found that this plant is an excellent species for the conservatory and cool greenhouse, when at this time the flowers, curiously enough, do not close in the daytime, so that the plants are continuously attractive and scent the house with a delicate fragrance. As cut flowers they are also useful, and last three or four days perfectly in a warm room. Cut with long stems they have an informal look, and are very effective. They grow readily in a solid bed, and are

equally at home in a pot containing a liberal amount of good soil. *N. affinis* has also the merit of flowering for a long season, and might be useful to the commercial florist with a local trade, as it will certainly be appreciated by the private grower who enjoys something outside of the ordinary run of greenhouse plants. It is, of course, an inexpensive plant, costing nothing beyond the care of growing.

Elizabeth, N. J.

J. N. Gerard.

Strawberry Leaf Curl.

DURING the past year some visits have been made to Strawberry-fields complained of for a peculiar wilting of the foliage. The appearance is not easily described, but instead of the foliage remaining fresh and the leaflets horizontal, the latter bend up at the sides, lose their normal green, and assume a dryish and gray appearance. At first sight one cannot but think this behavior is due to a lack of water-supply; but the growers are firm in the opinion that plants in moist places suffer equally with those upon naturally dry ground. Many plants affected with the leaf curl were examined in the field, and nothing could be found at the root sufficient to account for the dried appearance. It was observed that, as a rule, the leaves showing the curl had a spot, sometimes several, upon the leaf-stalk often close to the clasping base. These spots are with an ashy centre and a purple border, and in general appearance resemble the "leaf spot," which, by the way, is usually found upon the leaflets of the same leaves. A microscopic examination drove away all doubt of any difference, and established the fact that the spots are due to *Sphærella Fragariae*, and probably cause a checking of the flow of sap, and thereby occasion the dried appearance. Such plants are seriously injured, because the fruit, depending as it does upon the foliage for its growth, must remain small and imperfect. It is not unusual for the fruit-stalk to be spotted like the petioles, and, therefore, such clusters are often worthless.

If the leaf-spot fungus, *Sphærella Fragariae*, an old enemy upon the foliage, is the cause of the curling of the foliage, it then brings the question of a remedy for the latter down to that of the eradication of the fungus. This can be done as has been demonstrated by the use of any of several fungicides as mentioned somewhat at length in previous articles upon similar subjects.

Rutgers College.

Byron D. Halsted.

Rose, Marchioness of Londonderry.—This comes to us as a new Rose of 1893, and it is one of the fine series which has emanated from the nurseries of Messrs. Dickson, of Newtownards, Ireland, during the past few years, and it has the distinction of having won the gold medal of the National Rose Society. It is hardy, with foliage that is at once a recommendation, being similar to that of the Ulrich Brunner, and quite as beautiful. The stems are also without thorns—a desirable feature in any Rose that has to be handled. The flowers are of the largest size, almost six inches across when fully open, of a most delicate shade of pink in the centre, something like that of the Daybreak Carnation, but paler, and shading from the centre to pure white at the edges. In all the English descriptions that we have access to, this Rose is described as pure white, but the pink shade is quite pronounced as grown here, reminding one of the old Souvenir de la Malmaison tint, and, indeed, it would not be surprising to learn that this plant has some influence as one of the parents of the Marchioness of Londonderry. The fragrance is similar also, and it has the smooth wood of the older kind. There seems to be no doubt that this new Rose will prove hardy, and it is listed as a Hybrid Perpetual, which is equivalent to the term Remontant. Both are unhappy terms as applied to outdoor Roses, as they rarely flower but once in a season. For forcing under glass the Marchioness of Londonderry can be highly recommended as being of a rare shade, pleasing, one of the largest Roses known, and as easy to force as Ulrich Brunner.

Those who have seen the new Rose Clio in London speak highly of it as a beautiful new white Rose. It is one of Paul's, and we may expect to hear more of it, since hardy white Roses are scarce.

South Lancaster, Mass.

E. O. Orpet.

Early-flowering Perennials.—Unless the greatest care is taken in moving this class of plants few flowers should be expected from them the first year, unless they are moved before their spring growth starts and a large amount of soil is taken with them. With every precaution, such plants as our native *Dicentras*, Spring Beauties, Dogtooth Violets and Trilliums had better be left until they have gone to seed. Some of them, however, like the Trilliums, when set out in early spring, make a better growth the second year than they would do if

the transplanting is deferred until autumn, when the leaf-buds have formed. There is a dormant period in the life of many early-flowering plants, especially those with fleshy and bulbous roots, which comes after their stems have died down, when they can be transplanted with little loss of strength. When the plant has begun to make growth in early spring, or when it is left until the autumn growth begins, the small roots are broken, and new ones must be formed, and this is always something of a drain upon its vitality.

Madison, N. J.

W. P.

Correspondence.

The Opening of the Fire Season in Minnesota.

To the Editor of GARDEN AND FOREST:

Sir,—From the 15th to the 22d of March forest fires were frequent in the more open parts of Minnesota. The smoke from these so filled the air on the 22d as to make long sights with a surveying instrument impossible. These fires often originate, as has been stated and published many times, through a lack of intelligence on the part of people using fire. I lately noticed an instance that illustrates the effect of the proposed burning of tops after logging. The Eastern Minnesota Railroad Company had evidently instructed their section foremen to burn the brush on their right of way. There were but three men on the section, and with a track heaving by frost, and a great deal of brush along the line, they could not do the work properly. A fire was started in the brush, and the men went to dinner. Coming to the place a half-hour later, I found the fire running rapidly through the adjoining Pine.

In Minnesota most of the railroad companies have large grants of land for sale, and it would be a good policy for these companies to clear and cultivate the land along their tracks, both to illustrate what can be grown on the lands they have for sale and to keep the fires from spreading from their tracks and killing their timber. The evidence that fires started from locomotives last summer can be found along nearly every mile of track, and it must be that stockholders in these companies are not aware that they are doing themselves great damage by letting these fires escape.

Carleton, Minn.

A.

The Cherokee Rose.

To the Editor of GARDEN AND FOREST:

Sir,—The article in your issue for March 20th on the Cherokee Rose encourages me to relate a most satisfactory experience with the same plant. Some two and a half years ago I set Cherokee Roses along a fence consisting of seven barbed wires, some eight inches apart, and therefore about eight feet high. The plants were set at a distance of fifteen feet apart, and grew well, although I took care that they should be trained along the wires. By this process I soon had a fence which is hardly thicker through than the wire, and which is marvelously beautiful as it stretches along the road. It blossomed within the first year after planting, and produced in the second year such a mass of flowers that it seems as if covered in snow. During the past unfortunate winter it was three times badly set back by the frost, and though it showed flowers in the first week of February, a severe frost on the eighth of that month checked it again for weeks, although it was never deprived of its leaves, and as it ran between dead and brown Orange groves it was the one redeeming feature of the landscape, as it is to-day in a much higher degree. During the past three weeks it has made a full growth of new foliage, and the flowers, which came forth sparingly, now cover the fence from top to bottom. I have planted two miles of it, and it not only gives a great deal of pleasure, but it seems to be a fence which, while not thicker than a man's hand, is absolutely secure against man and beast. It has been grown without any trouble, only requiring the first careful training, which the plant easily follows. Later on it will undoubtedly require the cutting out of the older wood. Some of my neighbors flatter me by saying that this is the only instance they have ever seen where a barbed-wire fence has been transformed into a thing of beauty.

Maitland, Fla.

D. F. L.

Forestry at the Michigan Agricultural College.

To the Editor of GARDEN AND FOREST:

Sir,—Michigan has not attempted any work of consequence in forestry, although every dollar intelligently expended in this direction would return to the state in increased value. People take it for granted that nothing can be done to improve forest

interests. No one cares to study forestry, and our legislators, as a rule, oppose all bills which involve expenditures of public money except in relation to matters in which they are personally interested.

A small plat of two acres of trees in rows was started about eighteen years ago on our college farm, and has proved of considerable interest to a few persons. This farm, which originally contained rather more than a square mile, and consisted almost entirely of virgin forest, has been cleared, until now little more than two hundred acres remains of what, by a charitable construction, may be termed woodland. Owing partly, perhaps, to frequent changes of professors of agriculture in the College, who had control of both the cultivated fields and the woodlands, there has been no settled system of management of the forest. During the past winter the State Board of Agriculture conferred with the Professor of Forestry and with the Professor of Agriculture, and it was decided to attempt some systematic improvement of the College woodlands in an unostentatious and inexpensive way. South of one of the two railroads which cross the rear part of the farm is a tract of seventy-five acres, considerably broken by a marsh and many small cat holes. This has been cut over from time to time and in places some of the undergrowth has been killed by fires, while many seedlings and sprouts have been destroyed by cattle and sheep, while the inroads of grass have been encouraged. This area is to be cleared of all woody growths and the land subdued by pasturing and crops, and then the whole plat is to be planted with trees, according to what is recognized as the most scientific practice. Another section of seventy-five acres is more heavily timbered, much of it with Beech and American Elm. A strip on the north-east of a fence adjoining a railroad track has been cleared. This will be pastured by sheep for a year or two and then back-fired in such a way as to help in preventing fires from getting into the woods. The considerable quantity of Oak on this tract was removed four years ago, as the trees were losing rather than gaining in value. A tract of fifteen acres to the north was nearly cleared of timber some years ago, and all the trees larger than a man's arm that remain will be removed, so that the young trees and sprouts can have a good chance to grow evenly and occupy the land. Farther to the north, and separated from this tract by fields in cultivation, is a narrow strip containing fifty-four acres of good land, and here is the best timber standing on the farm. The strip is longest from east to west and slopes to the north adjoining Cedar River. A space four rods wide will be cut north and south through the middle; this will be kept clean and will illustrate one method of preventing the spread of fires, and at suitable times it will be back-fired.

From all this land which is to be retained in forest the old logs and dead brush should be removed or burned in open places. None of it has been pastured, and it contains a fine growth of young timber in variety. The whole tract has been surveyed and staked off into plats of some ten acres each, and a record will be made of the present condition of each and notes will be made of all future operations. Not a conifer can be found, with the exception of a few small Tamaracks, on any of these tracts. Native coniferous trees in variety will be planted in open places which suit them, especially in the narrow strip of a river. It is not expected that each plot will be treated alike. In a few slightly shaded places where the soil is light and dry, seeds of the common Locust will be sown or sprouts planted. We are induced to try the Locust in this way, since a few of these trees growing in our arboretum are now large enough to make good telegraph poles, and yet they are only twelve years old from sprouts.

There are other areas of woodland, one of them a piece of rough new ground which we proposed to turn into woodland, but there is no need to give any further details. My purpose in writing is to show that we are preparing here to have some practical instruction in forestry, and to invite suggestions as to the best method of managing our woodlands.

Agricultural College, Michigan.

W. J. Beal.

Recent Publications.

A Popular Treatise on the Physiology of Plants. By Dr. Paul Sorauer. Translated by F. E. Weiss. Longmans, Green & Co., London and New York.

This title is not of itself sufficiently descriptive of the book, which is not only a treatise on plant physiology, but a treatise prepared for a special purpose—namely, "for the use of gardeners or for students of horticulture and of agriculture." Professor Sorauer is something of an authority

in certain branches of botany, but he was also for years director of an institution for the scientific training of gardeners, and, therefore, in preparing his book he not only aims to describe the various organs of plants, with their functions, but to show how these scientific principles can be put to practical application. Of course, general students of botany will find in the book what is to be expected in a treatise on vegetable physiology, but its primary value lies in the fact that it has been written expressly for students of horticulture, and it constantly sets forth the scientific reasons for the best practice in propagating and cultivating plants. The opening paragraph of the book states that a gardener should not look upon a plant as unchangeable and restricted to a definite form, but as a plastic organism, capable of modification in all its parts. He should, therefore, be acquainted with the various functions of the plant, so that he may know how to regulate the conditions of its life in order to effect such changes as will adapt it most successfully to specific use. He must know the processes and the reasons for them which cause hard roots to become thick and succulent, as in the case of beets, and hard fruits to become large and juicy by an increase of their softer tissue, as in the case of apples and pears, and, in general, how to modify and change, where it is necessary, the normal development of a plant, as well as to cultivate it in its natural form.

Professor Weiss, who translates the book, after undertaking a course of lectures on vegetable physiology at the Botanical Institute in Manchester, England, realized the need of some work which combined science and practice in this natural way, and as there was no such work in the English language he translated Professor Sorauer's book, and thus has laid English students of horticulture under obligations. Now and then we find an apparent lack of familiarity with the very latest discoveries of science. The book, however, may be trusted as substantially accurate, and it has a special value because the practical use of this scientific truth is constantly borne in mind. For example, the author does not simply show what nutritive substances are needed by a plant, but he sets forth in detail the ways in which these should be prepared and administered to serve the best purpose. When it is explained that the roots of plants need air, it is also explained how the soil should be handled to meet this requirement. When the student is told how roots should be treated in repotting and transplanting, the reason for every step is added, and all the ordinary processes in horticultural practices are discussed in the same way. It would be difficult even for a skilled horticulturist to read the chapter on the Philosophy of Pruning, or the one on the Different Methods of Propagating from Shoots, without obtaining some ideas which would help him to do his work more intelligently and efficiently. Altogether, the book can be commended as a thoroughly useful one in a hitherto almost neglected field. It is a matter of regret that Professor Weiss did not go a little beyond mere translation and bring the science of the book thoroughly up to date in every point.

Notes.

Trim plants of *Boronia heterophylla*, with their bell-shaped little flowers of brilliant carmine or crimson, have become quite common as plants for Easter decoration. It is an Australian shrub, resembling *B. elatior*, but much neater in habit and more floriferous.

Among the cut flowers now coming from Bermuda are spikes of *Gladiolus*, most of them being those of the variety Shakespeare. These flowers did not arrive in very good order, but well-flowered spikes arriving in good condition at this season would, no doubt, have some depressing effect on the flower market here.

A dried plant of the new Sweet Pea, Cupid, seeds of which are to be disseminated by Burpee, of Philadelphia, next year, shows that the plant grows about ten inches high, and spreads out into a close bushy head, some fifteen inches across and

covered with white blossoms. Of course, the stems of the flowers are not as long as in the climbing Peas, but there are many places where the dwarf plant can be used to advantage, and there can be no doubt that the California paper is correct which declares that it will make an interesting pot-plant.

A Dutch horticultural journal says that an excellent way to preserve fresh nuts is to place them, immediately after gathering, in clean flower-pots, the holes in which have been stopped, and, covering them with a tile or bit of slate, to bury them in the earth until they are needed for use. The main thing is to protect them completely from the action of light.

The delicate and remarkably sweet-scented flowers of *Chimonanthus fragrans* are often fully open in latitudes south of Philadelphia in February. Mr. Joseph Meehan writes that he has been watching for the appearance of these flowers for some time, and, in his disappointment, has at last examined the shrubs closely, to find that the buds had all been destroyed by the frost, sometimes when they were about half-open. There are flowers on the prostrate stems of *Jasminum nudiflorum*, but the buds on the upright-growing shoots are still tightly closed.

Professor Wood, while he was a member of the staff of the New Hampshire Agricultural Experiment Station, made some tests with regard to the flow of maple sap which are of interest. Maples are usually tapped to the depth of about an inch, and this practice is based on the belief that the sap comes chiefly from the wood of recent growth, so that any tapping deeper than the layers made during the last six or eight years is useless labor and an unnecessary injury to the tree. Professor Wood's experiment, however, seems to show clearly that the flow of the sap is largely dependent on the depth of the tap, and that sugar-makers may with great profit tap their trees to a depth of four or five inches. The additional injury to the tree is slight, especially if the hole is small, and when a three-eighths of an inch bit is used and the bark is left uninjured, the holes will be grown over the first summer after tapping. It seems that twice the amount of sap can be obtained by tapping four inches deep instead of two, while the sap from deep boring is almost as rich as the other. The exposure of trees to the sun has much to do with the result from tapping on different sides, and there is little doubt as to the correctness of the popular view that the trees should be tapped on the south side wherever practicable.

In a recent lecture, Mr. D. Morris, Assistant Director of the Royal Gardens in Kew, noted the fact that the commerce in vegetable fibres was one of the most important in Great Britain, and that the imports in 1893 amounted in value to forty-five millions sterling, and the export of manufactured goods reached a value of seventy-four millions sterling. Of imports, nearly all the cotton, flax, hemp and paper material came from foreign countries, and it seemed to Mr. Morris a matter of regret that Canada could not become a great flax-producing country, that New Zealand did not improve its phormium production for the higher class of textiles, and that cotton and ramie were not grown in the West Indies. Cellulose is the essential element in all fibre. Cotton, sola pith, ivory nut, linen rags were all cellulose, and in the Kew Museum fragments of linen cloth found between bricks of pyramids erected twenty-five hundred years before Christ, showed that in a dry atmosphere cellulose is practically indestructible. One of the new fibres, especially interesting and quite unknown in Great Britain, is to be seen in a cuirass made from a kind of wild pineapple, and this suit, worn by the Indians of South America, is padded before and behind with vegetable silk from the fruit of the Yachan, *Chorisia insignis*. By rolling themselves in water the silk swells until the cuirass becomes arrow-proof.

Since the best teachers of science in these times insist that their pupils shall study objects before they receive much instruction from books, instructors of botany find it difficult to procure at any given season of the year enough fresh material to fully illustrate different subjects. In following any textbook, for example, enough specimens to illustrate the different sections of the book as they are taken up at different dates, can rarely be found. To obviate this difficulty, Professor Beal writes to *Science* that he has collected quantities of stamens of different plants, say, the Barberry, Sassafras, Lobelia, Cypripedium, etc., and preserved each kind by itself in a solution of twenty-five per cent. alcohol, or of one of formalin to one hundred of water. These specimens are all ready when the subject of stamens comes to be studied, and the preserved objects can be placed in a small dish before the pupils when

fresh specimens cannot be procured. If they are not allowed to dry they can be used for successive classes. In the same way Professor Beal has preserved forms of pistils, the torus and other parts of plants, including fruits of various kinds, such as half-grown plums or cherries, fruits of the Mandrake, Bloodroot, Mulberry, etc., at different stages of growth, and in this way lessons in morphology can be made more impressive than they would be if one illustration was used at one time, and the others a week or a month later.

Among the pears in market the Winter Nelis, with its beautiful gray-russet coat, fine-grained, buttery flesh and rich aromatic juice, is still to be found in limited supply. Easter Beurre, though not so beautiful, is much larger and is always prized for its melting quality and rich flavor, and good pears of this variety now sell for \$1.50 a dozen. P. Barry is hardly yet at its best. It is a large and beautiful fruit with a vinous flavor, but its flesh is somewhat stringy, so that it can hardly be called a pear of the very finest quality. It commands as good a price as Easter Beurre, however, and will be the leading pear in the market when all others are past their season. The finest apples here now have been coming from Vermont and have sold for exceptional prices. These have been Newtown Pippins, Northern Spies and a few extra Baldwins. The crop of Washington Navel oranges, from California, is so nearly exhausted that prices have grown rather more firm, and fair fruit sells for \$3.50 a box and upward. There are practically no seedling oranges from California in this market. They are met half-way across the continent by West Indian fruit, which commands fully as much in Chicago as the California product. Good Washington Navel oranges retail for sixty cents a dozen, Messina Blood oranges for the same price, and the best Jamaicas for fifty cents a dozen. Almeria grapes, if in large clusters and finely colored, bring fifty cents a pound. In spite of the arrival of the large supply of tomatoes which is coming from southern Florida, Cuba and Bermuda, solid hothouse tomatoes sell for seventy-five cents a pound. String beans, from Florida, bring \$8.00 a crate at wholesale, and green peas from the same state bring \$5.00. Asparagus is now coming from as far north as North Carolina, and is worth seventy-five cents a bunch. Florida is sending new beets and new cabbage. From Bermuda are coming new beets, carrots, onions and parsley. The best hothouse cucumbers are from Boston, and bring \$2.00 a dozen.

Ignatz Forsterman, one of the most enterprising and accomplished of the commercial florists in the vicinity of this city, died at his home in Newtown, Long Island, on the 29th of March. Mr. Forsterman was born in Coblenz, Prussia, in the year 1854, and after studying in the Garden Institute, in his native city, he acquired facility in the practice of his calling in various horticultural establishments of his native country, in Switzerland, France and England. He became specially skilled in the cultivation of Orchids, and by his habits of close observation he acquired a very comprehensive knowledge of these plants and their habits. In the year 1881 he began a series of remarkably successful collecting tours for an English firm, and sent home many new plants from India, the Malayan Archipelago, Burma and other parts of Asia. His knowledge was supplemented by such energy, industry and fearlessness that no labor or hardship discouraged him. The trying climate, however, undermined his strong constitution, and since he settled in this country in 1886 his health has always been delicate. He bore this burden, however, with cheerful courage, and, in spite of many drawbacks, he established a prosperous business, some features of which were absolutely unique. He became a large importer of such Orchids as could be profitably grown for cut flowers, and sold them in quantities to florists who grew them for market flowers, while at the same time he did not allow his collectors to neglect the search for valuable rarities. Among the best-known Orchids which he personally collected was *Cypripedium Spicerianum*, which he rediscovered; *Dendrobium Sanderianum*, *D. cruentum*, *Cœlogyna Sanderiana* and *C. Forsteriana*; *Cypripedium Sanderiana* and many others, besides such interesting plants as *Pteris Victoriae*, which has become a universal favorite. Besides these he discovered a number of species and varieties, specimens of which are now locked up in the Reichenbach herbarium.

The death of Mr. Forsterman is a genuine loss to horticulture, but those who knew him best will miss him more for his high moral qualities than for his helpful knowledge in his chosen pursuit. He was a man of singular gentleness of disposition, modest, truthful and unselfish. His ability always commanded respect, while the genuine worth of his character won the esteem of all who knew him.

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLES: —Public Reservations in the State of New York	151
A Memorial for Francis Parkman.....	151
Park vs. Grove.....	<i>F. A. Waugh.</i> 152
The Banksian Pine in the Nebraska Sand Hills. <i>Professor Charles A. Keffer.</i> 152	152
FOREIGN CORRESPONDENCE: —London Letter.....	<i>W. Watson.</i> 153
NEW OR LITTLE-KNOWN PLANTS: —Echinocactus Wislizeni and some Related Species. (With figure.).....	<i>J. W. Toumey.</i> 154
PLANT NOTES.	154
CULTURAL DEPARTMENT: —A Test for the Quality of Potatoes.....	<i>Professor E. S. Goff.</i> 155
Notes on Orchids.....	<i>E. O. Cope.</i> 159
Caladiums for Outdoor Use.....	<i>G. W. Oliver.</i> 156
Flowers of the Season.....	<i>J. N. Gerard.</i> 157
Plants for Spring Forcing.....	<i>W. H. Taftlin.</i> 157
Thinning Grapes.....	<i>William Scott.</i> 157
The Vegetable Garden.....	<i>W. N. Craig.</i> 158
Bulbocodium vernum.....	<i>K.</i> 158
CORRESPONDENCE: —Aerial Roots of Carnations. (With figure.).....	<i>Professor Byron D. Halsted.</i> 158
The Preparation of Bordeaux Mixture.....	<i>E. G. Lodeman.</i> 159
NOTES	160
ILLUSTRATIONS: —Echinocactus Wislizeni, var., growing in the Foothills of the Santa Catalina Mountains, Arizona, Fig. 24.....	155
Carnation Plant with Aerial Roots, Fig. 25.....	158

Public Reservations in the State of New York.

FOUR years ago a body known as the Trustees of Public Reservations organized under an act of the Massachusetts Legislature, for the purpose of acquiring and opening to the public, under suitable regulations, beautiful and historical places and tracts of land within that commonwealth. The establishment of this commission was the act of an enlightened community. It was a step forward, and offered an example and a challenge to the public-spirited people of other states to adopt similar measures, until it shall become a recognized policy throughout the country to preserve for posterity the natural beauty we have inherited, and to protect for the inspiration of future generations all those places which are rendered sacred by patriotic memories. Of course, there have been sporadic efforts in this direction all over the country. Pennsylvania has the camp-ground at Valley Forge; New Jersey has acquired the fine old colonial mansion and grounds at Morristown, where Washington held his headquarters, and this state has taken possession of Niagara and has made some effort to save the Adirondacks. But the Massachusetts plan has the advantage of being comprehensive and complete. No special legislation is demanded. The trustees can accept donations, purchase property, make necessary regulations for the maintenance of these reservations, and have all power necessary to acquire and preserve for public use forever any places which it may be desirable to secure.

It is an encouraging fact that the Legislature of New York has also taken action in this matter, and that Trustees of Scenic and Historic Places and Objects have been organized under law in this state. This result is largely due to the labors of Andrew H. Green, Esq., of this city, who is especially desirous to keep from defacement and ruin certain localities of historic interest in the upper part of this city and elsewhere in the state. In his original memorial Mr. Green called attention to the fact that there were many places in this state made memorable by conflicts during the half century of the French and Indian wars of the colonial

era and by the stern conflicts of the Revolution, and, besides these places which are hallowed by their connection with the past, the varied topography of the state includes landscapes of world-wide celebrity, water spectacles and picturesque islands, incomparable lake areas, wooded mountain ranges and scores of picturesque valleys, which ought to be preserved in their primitive beauty. This Board of Trustees has organized in a practical and business-like way, with Mr. Green for President; John N. Francis, of Troy, for Vice-President; Edward P. Hatch as Treasurer, and John Winfield Scott as Secretary. The incorporators are all men well known for their public spirit, and as they come from all parts of the state it is expected that through their influence local historical societies, town boards and private individuals will be stimulated to coöperate with the trustees.

We need not add that in our view of the case this action of the state of New York is far removed from anything trivial or merely sentimental. We believe that the opportunity to drink in the quiet delights of natural scenery is more and more a necessity, especially to the thronging laborers in our busy towns, and that the contact with natural beauty is distinctly refreshing and uplifting. We also believe that places hallowed by patriotic action and suffering, minister directly to the mental and moral health of the people by the appeal they make to our generous passions. Americans are sometimes inclined to reproach themselves for possessing less interest in the past than that which prevails in the older civilizations of Europe, but it is little more than a year ago that a society precisely like those we are discussing was formed in England for the purpose of protecting scenes of natural beauty and historical renown from being vulgarized and ruined. Quarrymen are defacing the Palisades in our own country, but Cheddar Cliffs are suffering in the same way in England, and the necessity of coöoperating to protect such places has been felt in England just as it has been in Massachusetts and New York.

Every public-spirited citizen of the Union ought to realize the fact that many places in the country around which interesting memories cluster are in danger simply because there is no custodian to whom they can be legally transferred, and by whom they may be guarded. The disfigurement of natural beauty will go on, old landmarks will be destroyed and old earthworks leveled under the plow whenever they come under the ownership of men who have no feeling for their beauty or interest. Every state ought to make haste to pass a law incorporating a body like these trustees. The good work accomplished by such a body will not cease with the simple protection of a spot here and there. It will invite the attention of all who visit and enjoy these places to their value, and it will develop a sentiment which will grow by exercise, and will assist to a certain extent in inspiring the people with something like a reverent regard for natural beauty wherever it is found. If this sentiment ever becomes as pervasive and vigorous as it should be, there will be less need to set apart special reservations, for all the people will be prepared to rise against the obliteration and defacement of natural beauty. The vandalism of the advertiser will cease, the great corporations will no longer needlessly mar the most pleasant prospects in operating their mines and quarries and railroads and factories, and each generation will feel it a sacred duty to leave the world to their successors as fair a dwelling-place at least as they found it.

A MOVEMENT is on foot to commemorate in some appropriate way the genius of Francis Parkman. As a historian, as a man of letters, as a true hero who added dignity to American scholarship in spite of life-long physical limitations, Francis Parkman deserves a grateful recognition by his countrymen. It would hardly come within the field of this journal, however, to invite attention to this movement if Francis Parkman, in addition to his other claims to

distinction, had not been eminent as a horticulturist and untiring in his efforts to preserve our rich inheritance of natural scenery. No pen has described the grandeur of our primeval forests with such poetic truth as his; no man ever loved nature more sincerely. In the very first number of this journal he made an eloquent plea for the protection of the forests of the White Mountains, and till the day of his death this subject was one in which he took a vital interest. This movement, however, makes appeal in a still more direct way to every one interested in horticulture as a fine art. It is not decided what form this memorial shall take, but it is proposed to erect it in the garden that Parkman loved, on the banks of Jamaica Pond, which has now been taken as a part of the Park system of Boston. Here, thirty years ago, he wrote the *Book of Roses*, which remains a standard authority in many branches of this subject to this day. Even before this the first collection of plants sent to America from Japan was planted in this garden, including the beautiful double-flowered Apple which bears his name, and many other plants now well known to our gardens. Here was established one of the very earliest good collections of hardy herbaceous plants in the country; here he made those experiments in hybridizing and cross-breeding which were described in one of the most interesting horticultural papers of its time. It is altogether fitting that every American who loves garden-art should have the privilege of contributing to this memorial of one who holds such a distinguished place in the development of horticulture in America. Contributions can be sent to Mr. Henry L. Higginson, 44 State Street, Boston. The committee in charge are men of cultivated taste, and there is every assurance that this memorial, whatever it may be, will not lack adequate dignity and refinement.

Park vs. Grove.

A FASHION is prevalent in some western states which is of enough importance to warrant some comment, and if the mental derangement which it seems to indicate can be properly diagnosed and treated, the undertaking will be worth a great deal to many communities. Now, there are very few real parks in western towns, unless delightful bits of virgin scenery are to be accepted under that head. The pleasure-grounds where, with natural conditions more or less propitious, an intelligent art has wrought any satisfying or pleasing effect, are exceedingly rare. At the same time there are not wanting hundreds of attempts in this direction. Almost every prairie town of any consequence at all has its so-called park. Sometimes this park and the fair-grounds are combined. Whether the park be fair-grounds, race-track or plain park, however, the location is usually upon some thoroughly flat, featureless and treeless plat, where the City Council and the Street Commissioner can give their creative instincts full swing. This park is laid out in intricate and wonderful patterns. It contains race-tracks, baseball grounds, camp-meeting stands, carp ponds, fountains or fences, according to the whims of the Street Commissioner and the demands of the populace. It is profusely set with trees, Cottonwoods having a large majority, and these are then left to struggle with a magnificent annual crop of Sunflowers. This picture is not in the least overdrawn. Any one who has ever lived in the west knows it to be the sober truth. As a consequence of the construction and maintenance of this park it is unfrequented and neglected. If the county fair is held on the grounds in the fall the Sunflowers are mowed, and for three days the park is crowded and useful.

Now, it is a strange companion picture to this which one sees if he visits "The Grove." Near most towns will be found pieces of natural woodland, usually along some stream, to which the picnic parties always turn with a natural impulse, which largely discredits their ill-conceived ideas of a park. Every town has its "Wilson's Grove" or "Johnson's Grove," which is a place of this sort—virgin

woods and streams and rocks, unmarked by any attempt at art. This is the place to which the citizens all retreat when the appetite for fresh air and shade and outdoor rest is to be satisfied.

The name Grove, as applied to this picnicking rendezvous, in contradistinction to the Park, is of some interest. These terms are commonly accepted and used with the utmost clearness of distinction, showing that in the popular mind the two articles are in no way related. Nevertheless, it would appear at once to the artist in landscape that the grove is by far the more satisfactory park. And were the parks of western cities planned by landscape-artists there is no doubt but that they would usually be located where unperverted instinct has found a satisfying grove, and seldom or never where false instruction has led citizens to make their so-called parks.

I have in mind one particular western village of more than usual culture and enterprise, which may, however, be taken as an example. This town has expended many hundreds of dollars in making a park on forty acres of valuable land. One corner is kept mowed for a baseball field, and this is the extent of the use found for the park. Quite as near the town, on the opposite side, are uncommonly fine stretches of natural timber, a beautiful river, suitable for boating and bathing, some hills and ravines, which would make a delightful park. These woods, used otherwise only for pasture, constitute The Grove; and to them comes the crowd for the soldiers' reunion, the picnic, the circus, and so forth.

Many times delightful results might be obtained if the work which has been put on a city park could have been judiciously expended on The Grove. And this shows us the direction in which lies the remedy. The existence of the park shows the public spirit and liberality of the citizens. The general favor in which the grove is held demonstrates the unspoiled instinct for sylvan pleasures. The solution of the difficulty would be to unite the two, and here is a problem worth attacking.

F. A. Waugh.

The Banksian Pine in the Nebraska Sand Hills.

SO far as I know there has been but one experiment made with *Pinus Banksiana* in the plain region. In 1891 the Chief of the Forestry Division furnished Mr. H. C. Brunner, of Holt County, Nebraska, enough trees to plant three experimental plats of one acre each on the crest and slopes of one of the highest sand hills in the entire Sand Hill region of Nebraska. One of these plats was planted principally to Banksian Pine, the remaining species being other conifers.

This Pine was chosen because it thrives on the sand dunes of Lake Michigan, and the soil conditions of the two localities are not dissimilar, consisting of an almost pure sand. In a visit to the Nebraska plantation last October I was surprised to find the sand quite moist only a few inches below the surface, on the crest of the ridge, in spite of an unbroken drought of months. The trees were four to six inches high when planted. Practically, all the other species failed, only a few Scotch and Bull Pines showing where hundreds had been set. But the Banksians had thrived. While yet three miles from the plantation they were easily discernible, a green patch on the very crest of the brown sand hill. Examination showed that over half of the trees, which had been planted two by four feet apart, were in thrifty condition, ranging from ten inches to almost four feet in height. The best growth of the year was eleven inches. The trees had been set in a furrow made in the unplowed sand, on which grew a scant herbage of grasses. Had the plat been plowed the sand would have blown away, as is proven by the many "blow-outs" seen while crossing the Sand Hills from Burwell to Ainsworth. The scant vegetation held the sand in place, and the Banksian Pine had become established. Barring unforeseen accidents, there is sure to be, in the course of twenty years, a tiny Pine grove in this vast desert region, devoid of trees and

only useful for the splendid growth of grasses in its valleys.

The Banksian Pine has a great northern range, being found from Michigan north-westward through Minnesota and into Manitoba, but it is not a native of the plains region. In standing where a great percentage of Bull Pine failed—the latter being native within sixty miles—it not only shows peculiar adaptability, but suggests its extensive use as a pioneer tree throughout the sand hills of Nebraska—a region from thirty to sixty miles wide and over two hundred miles long.

Washington, D. C.

Charles A. Keffer.

Foreign Correspondence.

London Letter.

BULBOPHYLLUM GRANDIFLORUM.—A plant of this was shown in flower last Tuesday by Sir Trevor Lawrence under the very inappropriate name of *Bulbophyllum Burfordense*. It was first figured and described by Blume in *Rumphia*, iv., page 42, where it is said to be "wild in woods on the coast of New Guinea. Flowers the largest of the genus, above eight inches in diameter; scape six inches high. The dorsal sepal brownish and netted with a paler color, the others not netted. Lip whitish, with red spots." The flower on the plant shown by Sir Trevor Lawrence had a concave sepal four and a half inches long and two inches broad, the two lateral sepals being narrower, but quite as long. the petals and lip being small and inconspicuous. The color of the dorsal sepal was yellowish green, with gray mottling and darker veins, the other two being dull pale brown, with a gray reticulation. Rhizome as thick as a goose-quill, the pseudo-bulbs an inch apart, narrow, ovate, an inch long, each bearing an oblanceolate leaf eight inches long by two in width. Although wanting in color, this is one of the most remarkable Orchids introduced in recent years. Sir Trevor obtained it from L'Horticulture Internationale a few years ago, this being the first time it has been seen in flower in Europe. There is, however, another *Bulbophyllum* of this name, a figure of which will be found in *Lindenia*, vol. iii., t. 108 (1887), and which had been introduced from New Guinea by Monsieur Linden, and flowered in his nursery. Reichenbach identified this with Blume's plant, an extraordinary blunder, the two being very widely distinct. For the latter plant Mr. Rolfe proposes the name of *B. longisepalum*, on account of its very narrow attenuated sepals. Both, however, belong to the same section, namely, *Sarcopodium*.

BOLLEA SCHROEDERIANA.—This is a new species, according to Messrs. F. Sander & Co., who have lately introduced it, and who showed it in flower last Tuesday, when it was awarded a first-class certificate by the Royal Horticultural Society. It was a fine specimen, bearing eleven large fragrant flowers with white sepals and petals, flushed at the tips with rose, and a pink labellum, which had a short claw and a thick boss-like crest. Botanically it belongs to the *Zygopetalums*, but for garden purposes the sectional name, *Bollea*, is convenient.

DENDROBIUM CORDELIA is a new Veitchian hybrid between *D. aureum* and *D. euosmum leucopterum*, the latter being the seed parent. It most resembles *D. aureum*, the sepals and petals being cream-white, with a tinge of rose on the margins, the lip being purplish, with yellow blotches and veins. It received an award of merit. The "pedigree" of this hybrid is as follows: *D. Japonicum* × *D. aureum*—*D. Endocharis*; *D. nobile* × *D. Endocharis*—*D. euosmum*; *D. aureum* × *D. euosmum*, var.—*D. Cordelia*.

DENDROBIUM HILDEBRANDII.—We are indebted to Mr. Hildebrand, of the Shan States, in Upper Burma, for the discovery of this *Dendrobium*, as well as for the introduction of various other good garden-plants—that is, *Lonicera Hildebrandii*, *Aeschynanthus Hildebrandii*, etc. The *Dendrobium* was first introduced to England by Messrs. Low & Co. in 1893, when only a single plant, now in the collection of Baron Schroeder, was received. This week Messrs.

Low & Co. sold a large importation of it by auction, and as the species is known to be a desirable one, and the plants were in good condition, they realized good prices. The species is closely allied to *D. tortile*, which, again, is, of course, not unlike *D. nobile*, but there is considerable variation in color in the new one, some of the flowers being yellowish, others rose-tinted, the lip being blotched with red in some cases, pure yellow in others. The flowers are about two and a half inches wide, and, as in *D. tortile*, the sepals and petals are more or less spirally twisted. It is likely to become a popular plant with Orchid-growers.

DENDROBIUM NOBILE NOBILIUS.—A truly marvelous specimen of this beautiful Orchid was shown last Tuesday by Mr. E. Ashworth, Wilmslow, Cheshire. Some of the pseudo-bulbs, of which there was quite a sheaf, were nearly four feet long, and the number of expanded flowers upon them was three hundred and eighty-nine. Typical *Dendrobium nobile*, when well flowered, is one of the grandest of Orchids, and as the variety *nobilis* is probably the best of the many fine-named varieties of it now in cultivation, the magnificence of Mr. Ashworth's specimen can easily be imagined. The flowers are larger and darker in color than any, the sepals and petals being rich amethyst and the lip dark maroon, with a cream-white margin. There are not a few spurious plants of *nobilis* about, but all the genuine ones are from one plant, which was first shown in flower at Ghent in 1878 by Messrs. Rollison, of Tooting, when it nearly succumbed to exposure, but luckily it was saved by Mr. James, of Norwood, who succeeded in propagating six young plants from the old pseudo-bulbs.

JASMINUM SP. AFF. J. NUDIFLORUM.—Dried specimens of a Jasmine collected in Yun-nan by Mr. W. Hancock, F.L.S., have recently reached Kew, where it has been determined to be a new species allied to *Jasminum nudiflorum*. The latter is one of the oldest and best of our hardy winter-flowering scandent shrubs, its yellow flowers, freely produced in fascicles all along the whip-like branches, being the delight of many an old garden-wall in the depth of winter, if only the sun shines now and then. The new one has flowers exactly like those of *D. nudiflorum*, but at least twice as large, the dried flowers of the former being nearly two inches in diameter. It is to be hoped that living plants of this most desirable plant will soon be forthcoming. Perhaps Dr. Henry, now in England, but who, I believe, intends shortly to return to Yun-nan, will add the introduction of this plant into English gardens to his many achievements in the interests of botany and horticulture. *J. nudiflorum* is a native of China; possibly this new one is a big variety of it. Let us hope it is.

MAGNOLIA CAMPBELLII.—I have already recommended this grand Himalayan Magnolia to readers of *GARDEN AND FOREST*. To-day, Mr. Osborne, the gardener to J. Smith-Barry, Esq., M.P., Fota, near Cork, has sent me two magnificent blooms of it, cut from a tree twenty-five feet high, growing in the open air. He says it is not very free-flowering in the moist, usually sunless climate of Fota, but I have heard of the large specimen in Mr. Crawford's garden, in the same neighborhood, flowering very freely. It is quite hardy at Kew, even the severe weather of the past winter having done it no harm. The flowers are as large as those of *M. grandiflora*, but colored a charming rosy or blush-red, reminding one in their elegance of form and richness of tint of a dark variety of *Nelumbium speciosum*. It is a native of the eastern Himalaya at an altitude of 8,000 to 10,000 feet, where it forms a lofty tree with "white or rose flowers six to ten inches in diameter." The leaves are ovate, glaucous green, about eight inches long and deciduous.

CORNUS MAS.—The prettiest tree in the arboretum at Kew this month is the Cornelian Cherry, a well-known garden plant, but not nearly as plentifully planted here as it deserves to be. The branches are clothed from top to bottom in March with little clusters of small yellow flowers, which glisten in the sunshine and last several weeks. I should place it in the same category among good garden shrubs

or small trees as the Witch Hazel, *Hamamelis arborea*, and if I had a large bank side which I wanted to cover with a deciduous little tree that would produce a beautiful effect in early spring, I would plant Cornelian Cherry in preference to all others. I am not aware if it is largely grown in the gardens of the United States, but I should say it is hardy enough for the neighborhood of New York. It is a native of many parts of Europe and northern Asia. Its fruits are about the size and shape of olives, and cornelian in color. The beautiful American *C. florida* cannot be made to flower in this country.

London.

W. Watson.

New or Little-known Plants.

Echinocactus Wislizeni and some Related Species.

THIS fine large Cactus was first described by Dr. Engelmann in 1846. Since its discovery it has been one of the favorite Echinocacti in cultivation. It is by far the most abundant species of this genus in southern Arizona, and probably reaches its greatest development on the Tucson plains and adjacent foothills. So far as its distribution in Arizona is concerned, it is confined to the south-eastern portion of the territory, with the Tucson Mountains as its western limit. Its northern limit seems to be as marked as its western. Some forty miles north of Tucson it entirely disappears, and its place there and to the west is taken by *E. Le Contii*. It extends eastward through southern New Mexico into western Texas, and southward far into Sonora. This plant has been reported from much farther north than the range here given, but my observations for the past three years draw me to the conclusion that in such cases it has been confused with other species.

Echinocactus Le Contii was first described as a distinct species, but later placed as a variety of *E. Wislizeni*. There is no question but these plants are specifically distinct. The former is the characteristic Echinocactus from the mountains north and east of Phoenix to Yuma, occupying the valleys of the Salt and Gila Rivers and adjacent foothills. It differs from the latter in being usually much more slender and more apt to branch; not infrequently a dozen compact, globose heads form a single plant. *E. Le Contii* is seldom over a foot in diameter, and frequently only from four to six inches. It is usually from one to three feet high. A few specimens south of the Bradshaw Mountains, observed last summer, were nearly six feet in height and eighteen inches in diameter. The flowers appear during June and July, and the fruit begins to mature in August. The flower-buds are brownish-red and usually have an oval or obtuse apex. When fully open, the flowers are yellow. The under sides of the petals are more or less colored with brown and red. The fruit dries on the plant during fall and winter and sometimes remains, held by the dense tangle of spines, for several years. It is longer, narrower and more scaly than in *E. Wislizeni*, and the seeds are slightly larger. In the latter species the flower-buds are acute and the petals are conspicuously streaked with red. The flowers do not appear until August and September, fully two months later than in the previous species. The fruit ripens in November and December and forms a bright yellow crown, which stands out in marked contrast to the deep green stem. The somewhat flattened oval fruit is frequently two inches in length and a little more than half as wide. It is always crowned by the withered remains of the flower. It remains attached to the plant without drying throughout the winter and late into spring.

One who sees these two plants in the field would never mistake them as belonging to the same species. As early as April the apex of *Echinocactus Le Contii* is a dense tangle of numerous red pubescent, twisted, nearly mature spines. At this time the apex of *E. Wislizeni* is nearly free, the spines of the new growth being a half-inch or less in length.

Some miles east of Phoenix, at the eastern limit of the

range of *Echinocactus Le Contii*, and north of that *E. Wislizeni*, is found another large species of this interesting group, namely, *E. Thurberi*. This plant ranges from here along the headwaters of the Salt and Gila Rivers into New Mexico. It is much more of a mountain plant than either of the above-mentioned species.

An interesting plant grows north of Tucson, on the foothills of the Santa Catalina Mountains. I refer to a variety of *Echinocactus Wislizeni** (see fig. 24, page 155). The plant from which the description is drawn was collected some three years ago, and is now growing in the Cactus garden at the University. It resembles *E. Wislizeni* in the season of flowering and ripening its fruit and in the arrangement of the spines. Its golden-yellow flowers and white spines against the green stem make it one of the most beautiful Echinocacti with which I am familiar.

All of these species are known indiscriminately among the Mexicans as Bisnaga. Americans know them as "Nigger-heads" and "Barrel Cacti." They are all great, heavy plants, with strong, hard spines. *Echinocactus Wislizeni* sometimes grows to a height of seven or eight feet, and reaches a diameter of more than twenty-seven inches. I have observed specimens with as many as forty ribs. All of these plants are very succulent and entirely without a woody skeleton. The long slender roots are few and small, compared to the great weight and size of the plant. In this locality the large plants invariably lean to the south-west. Their weight, small roots and lack of woody skeleton make them very unstable, and they settle over in the direction away from the prevailing wind. The whole interior of the plant is a soft, spongy, white, parenchyma tissue, which is so saturated with sap that it may be squeezed from it by the pressure of the hand. This fact has been woven into the fairy tale that the thirsty traveler lost on the desert may secure, by cutting into this plant, copious draughts of a cool and refreshing drink.

The spongy tissue is used to some extent in making candy and pickles. Its value for such purposes, however, does not depend upon any special flavor or nutritive value in the plant, but rather in that it serves as a body to hold sugar and other materials.

University of Arizona, Tucson.

J. W. Toumey.

Plant Notes.

ANDROMEDA MARIANA.—A correspondent makes inquiries whether this plant is worthy of cultivation. Without doubt it is among the best of shrubs, and we can see no reason why it is not more generally planted, except the fact that it is a native plant, and, like many other native plants, has been neglected because it was originally the fashion to plant exotics. It is found along the Atlantic coast southward from Rhode Island in low, wet, sandy places. It is common in the Pine-barrens of New Jersey, and covers large tracts in Long Island. It is from two to four feet high. Its leaves are leathery, shining, oval in shape and deciduous. Its flowers, which appear in clusters from the axillary buds, are pure white, nodding, bell-shaped and of a wax-like texture. Unlike many other Ericaceous plants, it will thrive without being planted in peaty soil, although it grows well in deep loam mixed with peat. It is perfectly hardy. Its leaves remain on the long wand-like branches late in the season, and they often turn to an intense scarlet before they fall.

INGA PULCHERRIMA.—The Ingas are stove evergreens from South America and belong to the natural order Leguminosæ. Many of them have rather unattractive flowers of light pink, but the flowers of this one are a very rich shade of crimson. Mr. G. W. Oliver writes that a specimen of this plant, now in flower in the Washington Botanical Garden, is one of the leading attractions of the collection there. The

* *Echinocactus Wislizeni, albispina*, var. nov. Globose to subcylindrical. Number and arrangement of the spines the same as in the species, differing from them in that they are entirely white. Flowers golden-yellow, with no trace of red on the under surface of the petals, appearing in July and August. Scales of the ovary much more numerous than in the species, and usually overlapping even in the mature fruit.

beauty of the flower lies in the stamens, of which there are something like forty in each one of the twenty flowers which make up a single head. The plant thrives equally well in the temperate house or stove, but when grown in the latter it flowers from two to four weeks earlier. The flowers appear with the new foliage, and the contrast between the two is very pleasing. Every summer the plant should be encouraged to make as much growth as possible, as the flowers are always produced on the previous summer's wood and are grown on peduncles an inch and a half long. The shrub grows to a height of about five feet.

BRUNFELSIA (FRANCISCEA) LATIFOLIA.—Brunfelsias are evergreen shrubs, mostly from Brazil, and many of them have



Fig. 24.—*Echinocactus Wislizenii*, var., growing in the Foothills of the Santa Catalina Mountains, Arizona.—See page 154.

been long in cultivation. They need a warm house without too much sun, and, although they will take abundant water when growing actively, the ground should never be sodden, or the roots will suffer, and it is a long process to restore the plant to health. *B. latifolia* takes rank among very choice stove-shrubs, and healthy plants will be certain to bloom in profusion every spring. The flowers are an inch and a half in diameter, of a dark lavender color as they open, and they change to pure white. When planted in coarse peaty soil with good drainage they need no special care beyond a severe cutting back as they become established, in order to keep them compact—that is, to prevent them from growing into a straggling form.

Cultural Department.

A Test for the Quality of Potatoes.

EVERY one knows how much more palatable some potatoes are than others, and there is quite as marked a difference in their food value as estimated by the amount of nutriment they contain in the form of starch. Professor Goff, of the Wisconsin Experiment Station, has been making some tests with potatoes which are novel and suggestive, and they point the way to a line of investigation which it may be worth while to follow out with careful study. We reproduce, in a somewhat condensed form, Professor Goff's account of his experiments in the *Rural New Yorker*:

In making brine for beef it is an old custom to put a potato in water and stir in salt until the potato floats, and this usually proved a safe test. But if two or more potatoes are put in at the same time, they will rarely come up at once. Even when the potatoes are all of the same variety, and are taken from the same bin, considerable more salt is required to bring up some tubers than others. This means that some tubers have a higher specific gravity than others. Now, starch, the portion of the potato that makes it chiefly valuable for food, is heavier than water; hence the heaviest potatoes contain the most starch, and so have the highest food value. They are also finest for table use, because they have the most farinaceous or mealy quality when cooked.

Here is a pointer for potato epicures. By putting a bushel of potatoes into a barrel which is nearly full of water, and stirring in salt, the tubers of the lowest specific gravity—that is, those poorest in starch—will first come to the top. These may be picked off. By stirring in a little more salt another lot will rise, and thus the bushel may be assorted into several qualities. By rinsing the tubers in clean water as they are taken out, they are uninjured, either for table use or for planting, and it is surprising to one who has not made the test, to discover how great is the difference in the table quality of the lightest and heaviest tubers. The former will be soggy and salvy, while the latter will be flaky and farinaceous.

On discovering this marked difference in the quality of individual tubers of the same variety, the question naturally arose as to its cause. It has often been stated that pronged or knobby tubers are poorer in starch than others. The salt test easily shows this to be true. But some smooth tubers will usually rise as soon as the knobby ones, and it is an interesting fact that these light smooth tubers are often undistinguishable by any external mark from the heaviest ones, and this is true even of tubers that grew in the same hill.

Some years since I set out to discover the cause of this singular variation in the starch content of different tubers. The first suggestion was that it might be due to heredity. Accordingly, a lot of potatoes was assorted into three classes by the salt method, and the tubers showing the highest and lowest specific gravity planted separately. But no appreciable difference appeared in the specific gravity of the crops. The same line of selection followed another year showed no more definite results. The question next arose, whether the variation might not be due to the varying depths at which the tubers grew in the soil, and this appeared to be the true solution. Careful tests with several different varieties, and with different

methods of culture, carried on through two consecutive seasons, showed that the tubers that grew nearest the surface of the soil were lowest in specific gravity; those that grew deepest were highest, and those that grew in the intermediate depth were intermediate in specific gravity. This fact suggested that the temperature of the soil in which the tubers grow, may have an influence upon their specific gravity, and that a comparatively cool temperature favors high specific gravity. In support of this view, it may be added that potatoes grown in level culture averaged higher in specific gravity than those hilled, and tests have shown that level soil usually averages lower in summer temperature than that which is ridged.

Potatoes grown closely in drills were found higher in specific gravity than those grown further apart in hills—the more largely shaded soil of the drill culture being thereby rendered

cooler. The commonly accepted view that potatoes grown in comparatively cool climates are usually of better quality than those grown in warmer climates is supported by these results, and we would expect that mulching Potatoes during the hotter part of the season in the warmer climates would tend to improve the quality of the tubers.

The market value of potatoes should be based on their specific gravity. There is no reason why potatoes containing but twelve per cent. of starch should sell for as much per bushel as those containing twenty per cent.; yet such is the case under the present methods of sale. The latter are worth nearly double the former for food, besides being more desirable in every way. Variations as great as this in the specific gravity of potatoes are not unusual. The salt test admits of very easy and economical application. All that is needed is a large candy jar or other wide-mouthed, capacious glass vessel, a hydrometer, a little salt and a few quarts of clean water. A dozen uninjured tubers may be selected as a sample, washed clean and placed in the standard salt solution, which will at once answer the question as to their average specific gravity and consequent food value. When potatoes are sold on their merits as food, rather than on the amount of bulk that they fill, farmers will have some encouragement to produce tubers that contain starch, rather than those that contain water, and potatoes will be more used for food, because their food value and palatability will be increased.

Notes on Orchids.

Lycaste Skinneri.—This is one of the best-known Orchids, and one of the most satisfactory to grow, being of easy management and semi-terrestrial in habit. There is considerable variation in the flowers, which is quite noticeable when a number of plants are in bloom at the same time. One of the purest of white Orchids is the white form of *Lycaste Skinneri*; from this variety the colors vary to deep crimson through all the intermediate shades. A year ago we had some two dozen plants, but they took up too much room on the side benches, due to the spreading habit of the foliage, and we concluded to put them in baskets and suspend them in the cool greenhouse. The experiment has been a decided success; in fact, the plants seem to do much better than when the roots were confined in pots. The baskets are twelve inches in diameter, and some of these have at this time over fifty open flowers. The blossoms are very durable, owing to their wax-like texture, and the plants are especially suitable for room decoration at this season. To grow *L. Skinneri* well the cool house should be kept at about fifty degrees as a minimum. It is one of the easiest of Orchids to accommodate.

We find that these semi-terrestrial Orchids, *Lycastes* particularly, will take liquid nourishment at frequent intervals if applied in weak doses. Under this treatment bulbs of extra-large size are produced, and these bear from ten to twelve flowers each, and sometimes even more. The white form seems more delicate in constitution and needs a little more warmth and less moisture at the roots, or the bulbs become spotted with disease and are hard to grow out of it. A shady position is best during the season of growth, but in winter, when maturing, we give the plants full sunshine until the flowers commence to open. There is practically no resting period for *L. Skinneri*, or, at least, no continued period for drought at the roots; they should be kept moist at all times, and it is one of the reasons why the plants do not do so well sometimes when grown in pots.

Dendrobium nobile Allanianum.—Of the many well-marked forms of the old *Dendrobium nobile*, a few are conspicuous, especially among the dark ones. After the variety *nobilis*, the variety *Allanianum* is, perhaps, the best, the flowers being of large size, very dark and unique, in having a fine polish over the entire surface of the flower. It is as distinct in its way as *C. villosum* is among Cypripediums. We find it to be a good grower, much better than *D. nobile nobilis* in this respect, a great point in its favor, for it is difficult to grow some of the rarest Dendrobiums into specimens. We have given up the use of wood baskets for Dendrobiums, as this genus resents disturbance at the root more than most Orchids, and it is hard to separate the roots from the wood when it becomes necessary to place the plants in larger receptacles. We use perforated pans and suspend them with wires; it is easy to break a pan and take out the plant. In the *Orchid Review* some time ago one of the best English cultivators advised that nothing but clean sphagnum-moss be used for Dendrobiums, and asked gardeners to give this material a fair trial and report the results. I am in favor of the plan after a year's trial. These plants abhor sour, inert material about the roots, and

this fresh living medium seems to be just what is needed. At the end of a year, or after the resting period, this moss is, of course, dead, and we take a Stott sprayer, removing the cap, and with warm water wash every particle of moss from the roots. If the roots are matted about the pans these are placed inside of larger pans with a few pieces of drainage, and the surfacing of moss added. It is surprising how soon the young roots take possession of this fresh moss. We have plants of *D. nobile* three years old, from an old bulb, that made growths two feet long last summer, and in one instance as many as six leads starting away strong for the present year.

Young plants observed starting away from the upper part of the bulbs of *Dendrobiums* at this season should be taken off now and potted in small pots, and these placed in a basket and suspended in a warm house. It is surprising how soon these make good plants to take the place of older and worn-out ones. At this time care must be taken that no water gets into the young growths on dull days, or they will soon rot off and the plant receive a check. This is especially true of *D. Phalænopsis*. To avoid this trouble we have used nothing but fern-root for potting material; in this instance moss seems to retain too much moisture about the few roots made, and these are very susceptible to overwatering. The best time to repot *D. Phalænopsis* is now; small pans should be used—the smaller the better—and they should be suspended in the warmest position in the East Indian house. Plants of this species imported last fall are starting away finely hung up close to the light, and will flower sooner than those that were obtained some time ago and are well settled down to a regular period of growth.

Horticulture is said to be full of empiricisms, and even one genus of Orchids affords a study in the needs of each species. We often know nothing of the conditions under which they grow naturally, and when we are able to learn something of these conditions it is often impossible to imitate them under artificial means. So we have to grope along as best we may, sometimes stumbling upon a way in which a particular plant may be grown well for a long period.

South Lancaster, Mass.

E. O. Orpet.

Caladiums for Outdoor Use.

A BOUT this time it will be in order to look over the bulbs of the fancy-leaved Caladiums which are meant for use out-of-doors this summer. The plan of putting them into pots to start their growth is not a good one, since by this method they sprout very irregularly. The best plan, I find, is to chop up some sphagnum-moss pretty fine and start them in that. If the collection is large a place on the bench should be given them; if small, they can be put in boxes. Put a layer of the sphagnum in the bottom about two inches thick, place the bulbs on this according to their kinds, then with a mixture of equal parts of sphagnum and sand cover the bulbs over evenly to a depth of about two inches. Give a very slight watering, keep the temperature about sixty at night, with a rise of about twenty by day. They will begin to sprout in a very short time.

This is the best time for propagating the desirable kinds; there are several ways of doing this. Before putting them in the sphagnum-moss some people prefer to make incisions in the bulb just inside the resting growths—that is, make an incision in the parent bulb between the lateral growth and the central part of the bulb. Immediately after making the incisions see that they are filled with some finely powdered charcoal, as this tends to prevent decay. After sprouting it will be found that numerous roots have been formed; take care that a sufficient number of these are taken with each piece of the bulb, so as to enable them to take hold of the soil immediately. Another plan, which I find to work well with the stronger-growing varieties, is to allow the leaves to become nearly developed, then, if there are sufficient side-growths to warrant it, break off the central growth close to the bulb; this throws strength into the lateral growths and induces new ones to appear.

The fine-leaved varieties lately sent out are of little or no use for bedding out, as they do not stand the sun sufficiently well, and I may say that these kinds are unsatisfactory for most purposes, as they grow too slowly to make large specimen plants, and are very slow to increase when compared with some of the older kinds. These drawbacks are much to be deplored, as the new Caladiums are exceedingly beautiful, but the fact is they are bred with an eye to producing the most gaudy colors, and it has evidently been forgotten that these colors are produced at the expense of constitution. A few of the kinds I have found best for planting out in summer in the full sun-

shine are Dr. Boisduval, Reine Victoria, Edouard Moreaux, Hookeri, Chantini fulgens, Adolph Adams, Triomphe de l'Exposition, Madame Heine, Madame Alfred Mame, and Schmidzii.
Botanic Garden, Washington, D. C.

G. W. Oliver.

Flowers of the Season.

WHITE flowers are never so effective in the gardens as colored varieties, and the early Snowdrops, even if grown in profusion, leave something to be desired for color. The most effective coloring for several weeks has been supplied by colonies of a Taurian variety of *Scilla Sibirica*, *S. Sibirica Taurica*. One colony of these bright plants closely planted forms a carpet about a yard square, giving an indication of possible effects when largely planted. This *Scilla* has good, broad, light green foliage, and flowers profusely on stems about three inches long. The flowers are lighter-colored, and rather prettier, than those of the ordinary *S. Sibirica*, which has not yet come into flower. It is one of the handsomest of early spring flowers, and regularly appears with me before the Snowdrops are fully in mid-season. Another Squill, *S. Whittallii*, is darker-colored, with narrower leaves, and not as attractive. Asa Gray is said to have stated that a white form might be expected sooner or later among every species of flower. There are white forms of both *S. Sibirica* and *S. bifolia*. The former has not yet arrived here, but *S. bifolia alba* forms a colony of dainty pure white flowers at present. This appears to be a form of *S. bifolia*, and at a glance might be mistaken for a dull *Chionodoxa*, the flowers facing upward on the curved stems, and the leaves being narrow and dark-colored.

There are few brighter flowers than *Chionodoxa Luciliae*, which now enlivens the border. The type of this variety, which has large star-like flowers with bright blue-tipped petals with white eyes, leaves little to be desired as a small border-plant, besides which it may be readily secured without much expenditure of capital. The pink and white forms are flowers of exquisite beauty, but in my garden are not as vigorous in growth or as free-flowering as the type. They have never been found in large numbers in Asia Minor, and are said to not come true from seed, so that they are not plentiful. *C. Cretensis* is also white, or slightly tinted, but the white is impure and the flowers are inferior to those of *C. Luciliae*. *C. Tmolusi* is very much in the way of *C. Luciliae*, but the flowers are darker and the effect of the two is quite different when seen in masses. The large-flowered *C. Alleni* and *grandiflora* seem to require more careful culture than *C. Luciliae* to become effective in the border. Under ordinary cultivation the stems bear only two or three flowers. The red varieties of *C. grandiflora* are of a light purplish-red, but attractive. The smaller bulbous reticulate Irises are mostly out of flower. These, as I have noted before, are all hardy here, with the exception of *I. Histrio*, and flower regularly each season. *I. Bakeriana* is the prettiest of the smaller species of this section, while *I. histrioides* is the largest. These, however, all pale before the gayety of *I. Rosenbachiana*, which, as noted last week in *GARDEN AND FOREST*, is quite the best Iris of the season.

The late winter was a severe test of the hardiness of plants, and it speaks well for the hardiness of the Irises that there are no vacancies among the established plants in my collection of varieties of all sections. About the extent of the damage was the burning of the leaves of a few kinds, like *I. Tingitana* and *I. stylosa*, which are better grown under cover if certainty of flower is desired.

Elizabeth, N. J.

J. N. Gerard.

Plants for Spring Forcing.

WITHIN a few years past the practice of using plants in flower for house decoration in the Easter season has extended largely. Every year a wider variety of plants is forced for this trade, and every year better-grown and more shapely plants are demanded, so that the florists' shops are never so beautiful as they are at this season.

Among plants of comparatively recent introduction the improved form of *Astilbe Japonica*, known as variety *Compacta*, is found valuable for forcing. Its spikes are much more compact than those of the type, the flowers are semi-double and the color is almost pure white. This variety seems to force as readily as the well-known old plant, and it flowers quite as freely, while the blooms are more lasting. A still later introduction has been named *Astilbe Japonica floribunda*, and is claimed to be superior to the variety *Compacta*, but it has not been largely forced in this country as yet, and it is too soon to make comparisons.

The Bottle-brush, *Callistemon speciosa*, has been growing in popularity for two or three years past, and in some localities is much sought for. The bright-colored stamens of its terminal spikes of flowers are very showy. The plant belongs to the Myrtle family, and forces as readily as an Azalea, though a little longer time is required to develop its blossoms. It is preferably propagated by cuttings, and the young plants secured by this method are more floriferous than seedling plants.

Cytisus Andreatanus has also been tested to some extent for spring forcing, but, though its showy flowers are quite freely produced, the plant is somewhat naked in appearance and rather too stiff in outline. One of the Bladder-nuts, *Staphylea Colchica*, although an old plant, is just beginning to find favor in Philadelphia for spring forcing, although it has been put to this use for many years in England. This *Staphylea* bears panicles of white flowers similar to those of the American Bladder-nut, *S. trifolia*, but the plant is more dwarf, and the foliage is divided into five leaflets instead of three.

Single and double Lilacs are both used largely for conservatory decoration in the early spring, shapely plants between two and four feet high being the most satisfactory. Plants grown in pots during the preceding summer have the best roots and are most reliable. The Lilacs used for forcing are usually imported stock, and are generally grafted plants.

Pyrus Japonica has also been forced somewhat of late years, and the flowers are usually much lighter in color than they are on plants naturally grown.

Forsythia suspensa is still another hardy shrub that forces well if lifted in the fall, potted up and stored in a cold frame until it is needed. The Double-flowered Almond is also adapted to this use, and needs the same treatment. *Exochorda grandiflora* is rather too stiff in habit, and not bushy enough when small to make a good pot-plant. But it is forced to some extent. Hardy Rhododendrons and Ghent Azaleas can be brought into flower with as little trouble as the Indian Azaleas. But the Ghent Azaleas lack foliage, since the flower-buds grow much faster than the leaves when the plants are forced into bloom. Various shrubby Spiræas and Deutzias are used here, and they generally submit with grace to the forcing process, and all are beautiful in flower.

Some Acacias, notably *A. Drummondii*, *A. Riceana* and *A. armata*, are now found in the stock of all well-equipped establishments, and, though not new plants, are sufficiently uncommon to be genuine novelties to many buyers, and it is said that they have been sold as novelties by some dealers.

W. H. Taftlin.
Holmesburg, Pa.

[In addition to the plants named above, many others have been forced into bloom for the Easter trade in this city. Tree Paeonias, carrying two or three large flowers, are very showy. The Japanese Snowball is also effective as a pot-plant. Mountain Laurel, *Kalmia*, is quite abundant. The beautiful native *Andromeda speciosa*, as well as *A. Japonica*, are also offered, but are uncommon.—ED.]

Thinning Grapes.

IN the indoor grapyery thinning out of the berries is always more or less necessary, according to the variety of the Grapes, as some varieties mature much larger berries than others and, therefore, require more space. The most convenient stage of growth for thinning the bunches varies also according to the variety. Black Hamburg, Barbarossa and similar varieties which set freely, require to be taken at a smaller stage than those varieties which are more shy in setting, as the Muscat varieties. It is not advisable, however, to take them too small, as the berries which are going to stone cannot be determined from those which are not. If the clusters are neglected too long and become overcrowded, the thinning is difficult to perform. The bunches should never be touched with the hand as sweat from the fingers causes rust and disfigurement of the berries, and also impairs the bloom, which begins to form at an early stage. It will often be found necessary to raise the bunch or turn it around a little to get at it conveniently with the scissors, and this can best be done by means of a small piece of wood cut something in the shape of a pencil, but more gradually tapering to one end. This will also be found useful to steady the bunch when required. Thinning is practiced not only to enlarge the berries, but also to produce as large bunches as possible. Each bunch is divided into several small clusters, and the terminal berries on each of these should, if possible, be left and the inner ones thinned out; just enough of the latter being left to fill up the centre, so that the bunch, when matured, will remain compact when cut and laid on its side. If too severely thinned out in

the centre the bunch would fall flat when placed in a dish, which would greatly spoil its appearance for table use. All fair-sized bunches should have the shoulders tied up a little, and with large bunches it is often advisable to tie up several of the upper divisions. This allows the berries room to swell without being thinned out so severely. Grapes intended for winter use require more thinning than those to be used early, or they are apt to damp off in the centre of the bunch.

Tarrytown, N. Y.

William Scott.

The Vegetable Garden.

IN this latitude work in the vegetable garden is backward. Our first sowing of Peas was not made until April 6th, more than three weeks later than the earliest sowing last year. But there is too often undue hurry about getting seed into the ground as soon as frost breaks and before the soil has become sufficiently warm and dry. Sometimes a gardener takes pride in getting his seed in before his neighbors do, but those who wait until the ground works freely have the best garden in the end. We have now made sowings of Spinach, Carrots, Turnips, Beets, Parsnips, Salsify and Onions. We shall make a second sowing of Peas about the 20th of April, using Maclean's Advancer, Shropshire Hero and Juno. Champion of England, Stratagem and Telephone for the main and late crops are sown early in May. The middle of May is soon enough for Bush Beans, but for early picking we work in some well-decayed manure where the Violets are done blooming in cold frames, and plant one or two sashes with Early Mohawk about the 15th of April. In this way we get beans a month ahead of the first outdoor plants.

Onions in flats, under glass, should now be well hardened and ready to plant out. They produce much finer bulbs than when sown outside in the ordinary way. They ought to have rather more growing space, some eighteen inches between the rows and six inches between plants. Beets can be transplanted in the same way, but being more susceptible to injury from frost they should not be set out before May. Lettuce raised in frames can be planted out at once, and sowings of Lettuce and Radishes made at short intervals. Shallots and Garlic should be planted without delay. Leeks are not sufficiently appreciated, as they are much superior to onions for soups on account of their more delicate and milder flavor; they are easily cultivated and stand the most severe winter without injury. In the north of England and south of Scotland many people of the working class pay special attention to this vegetable and grow marvelously fine specimens, and the competition in the numerous vegetable shows is very keen. Seeds started now will give leeks before winter. They should be planted in trenches containing plenty of well-rotted manure and treated liberally like Celery. The finest variety we have grown is the Lyon; other standard sorts are Musselburgh and Giant Carentan.

Early Celery should now be pricked off in boxes and kept growing in a warm house. Before it becomes crowded we transfer ours to frames, planting some six inches apart each way. A little warm manure below the compost will give the plants a good start. Succession sowings for winter use can now be made. For this purpose we find Giant Pascal and Kalamazoo the most satisfactory. We tried a trench of the last named during the past year, and it kept in good condition until the middle of March. Egg-plants and Peppers, when large enough to handle should be pricked off, and Tomatoes for the main outdoor crop should be handled before they become crowded and spindling. For an early crop the plants should be grown singly in pots and staked up securely. They must not be allowed to get pot-bound and take on a yellowish color. Tomatoes fruiting under glass will now require abundant waterings. With the increasing sunlight artificial pollination may now be dispensed with. Liquid-manure, applied twice a week, and a surface-dressing of sheep-manure or some chemical fertilizer in addition, will suit pot-grown plants; lateral roots will require removing weekly, and some of the leaves shortened to admit light to the fruit.

Cabbage-plants should be well hardened before they are set out, and we find it risky to plant out Cauliflowers before May 1st. The plants grown in frames will need plenty of water and liquid stimulants to keep up free growth. Brussels Sprouts are the most useful of the Brassica family for winter, and the fact that large quantities are imported annually from Europe would indicate that more of these should be grown to supply the demands in the large cities. Many worthless strains of this vegetable are on the market, and it seems to be difficult to secure a reliable strain. It is very annoying to raise a good bed of these plants and find that not over one in twenty is worth

the space it occupies. Sutton's Exhibition and Aigburth are excellent sorts if they can be procured true to name, and now is a good time to make a sowing.

Melons and Cucumbers for an early outdoor crop can now be started in pieces of turf or in four-inch pots, thinning the plants out to four or five in each. Cucumbers in hot-beds require copious supplies of water in clear weather. The frames should be closed early in the afternoon after watering; the fruit will swell quicker if the blossoms are artificially pollinated. Lettuce, Parsley, Beet, Carrot and any other crops in frames should have abundant ventilation whenever the weather permits it, and the surface soil should be stirred occasionally, and the sashes removed whenever there is a warm rain.

Taunton, Mass.

W. N. Craig.

Bulbocodium vernum.—In warm, sunny spots this plant, the Spring Meadow Saffron, has been blooming for a fortnight or more. A native of southern Europe, it has long been in cultivation, but it is not generally planted in this country. The flowers are about four inches long, of a bright rosy purple when in bud, which changes to a somewhat lighter shade on full expansion. The plant associates admirably with the Crocuses and Snowdrops, adding a new and distinct color. It

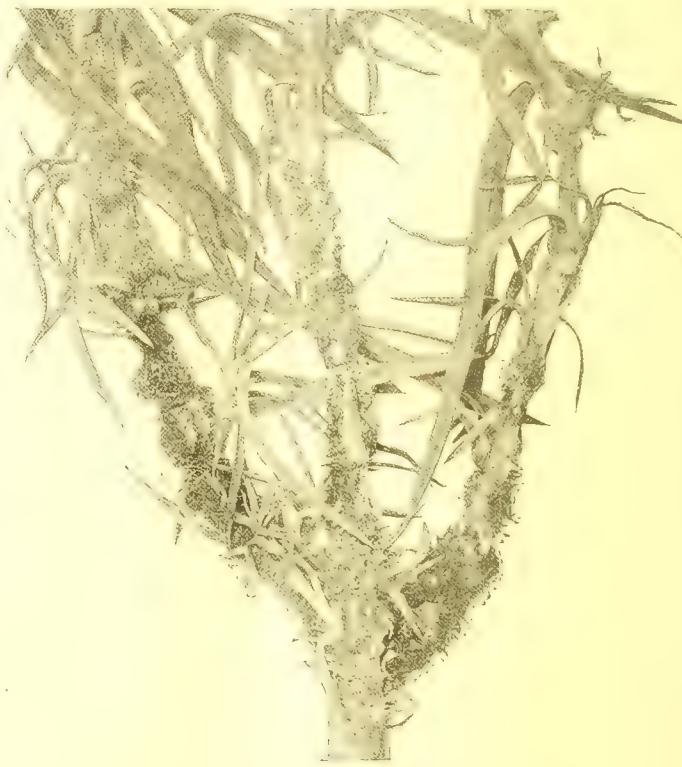


Fig. 25.—Carnation Plant with Aerial Roots.

is perfectly hardy, and, when once established, should not be disturbed for several years, since it is, like many of this class of plants, most effective when grown in masses. It should have the same treatment as the Crocus or Snowdrop. There is a variety with variegated foliage which is not desirable.

Boston.

R.

Correspondence.

Aërial Roots of Carnations.

To the Editor of GARDEN AND FOREST:

Sir,—Samples of strange-looking Carnation-plants have been sent to this station, with queries as to the nature of the trouble and the remedy for the same. At first sight the stems seemed to be covered with a peculiar dark growth unlike that of any fungus known to me. A further inspection showed that the stems had pushed multitudes of small roots (see fig. 25, on this page), which stood close together, and had turned dark brown in color, due to the growth of a black mold—*Macrosporium*, sp.

The precise reason for this peculiar development of roots along the stems cannot be stated, but since the plants had been watered frequently in excess it is not improbable that the formation of the roots was a result of this surplus of moisture.

As only about two dozen plants in a house of ordinary size behaved this way, it is likely that some plants have a greater tendency to throw roots than others or were more favorably situated, or both.

Rutgers College.

Byron D. Halsted.

The Preparation of Bordeaux Mixture.

To the Editor of GARDEN AND FOREST:

Sir.—The Patrigeon method of preparing the Bordeaux mixture was first published in the spring of 1890.* The directions were to add the milk of lime to a solution of copper sulphate until a twenty per cent. solution of the ferrocyanide of potassium would show no discoloration when added to the mixture. This process soon became known in America, and we find the following directions for preparing the fungicide:†

"The copper sulphate is weighed and mixed with an amount of water sufficient to dissolve it. When it is completely dissolved, the lime, in the form of thin whitewash, is strained through burlap (gunny sacking) into the copper sulphate solution. A drop or two of potassium ferrocyanide (saturated aqueous solution) added from time to time, after thoroughly stirring the mixture, will show when enough lime has been added to form the Bordeaux mixture. If not enough lime has been used the drop of ferrocyanide will turn to a very dark color the moment it touches the mixture; if enough lime has been used the ferrocyanide will not change color when it is dropped into the mixture."

The substance of the above extract was repeatedly published, and it appeared as late as the summer of 1894.‡ Users of the test have been at the same time cautioned to use a sufficient amount of lime, since an excess would do no harm to foliage. But in no case has it been advised to add an excess of lime, the amount called for by the test being sufficient, provided the preparation was well stirred and the proper care exercised in the use of the test. Yet in the fall of 1894 we find that the original formula is no longer unconditionally recommended, but that "a little more lime should be added after this test shows no color," in order that there may be no doubt that enough shall be present.§

The question now arises, why is lime added to the Bordeaux mixture after the immediate demands of the ferrocyanide test have been satisfied? The following considerations may help us to find the correct answer:

(1) When the milk of lime is added to a solution of copper sulphate, the latter is broken up and new compounds are formed. The lime is not added merely to neutralize the acidity of the solution, but a sufficient amount should be present to satisfy all chemical changes. But all these changes do not appear to take place at once; "so it occasionally happens that after the mixture has been standing a few minutes the potassium ferrocyanide will again give the dark color, showing that not enough lime had been added."|| It is an undisputed question that a sufficient amount of lime must be added to prevent any of the copper sulphate from remaining in solution, otherwise the foliage of nearly all plants will sustain injury. Yet the Bordeaux mixture, when prepared according to the original directions of Patrigeon, is not supposed to contain an excess of lime; in fact, the value of the test rests in its power to detect just when no more lime is needed.

(2) That foliage is occasionally injured by the Bordeaux mixture when prepared with the minimum amount of lime cannot be doubted, for injury has followed the use of the mixture when it contained considerable quantities in excess. No definite experiments appear thus far to have been made for the purpose of comparing the action of the Bordeaux mixture when prepared with the ferrocyanide test, and that made in accordance with the commonly accepted formulas. Fairchild, who has made a special study of the Bordeaux mixture, was in doubt regarding the advisability of accepting Patrigeon's method without further experimentation. He says:¶ "It is possible, also, that pathologists have proceeded too rapidly in recommending the use of potassium ferrocyanide in the preparation of this mixture. It has not yet been definitely settled that the mixture, when prepared according to this method, will not contain the basic sulphates and occasionally prove injurious. In attempting to avoid the inconvenience in the preparation of Bordeaux mixture the greatest care must be taken that its real value is not impaired. The excess of lime in the mixture, instead of being an injurious element, may

prove beneficial, preventing injuries from the copper salt, and in other ways being of advantage." Professor Bailey, after extended observation throughout this state during the past season, has come to the following conclusion: "This test indicates when sufficient lime has been added to correct the present injurious effects of the sulphate of copper; but in wet seasons—if, in fact, not in all seasons—an extra amount of lime may be needed to neutralize subsequent changes in the compound. I am strongly of the opinion that the regular formula for the Bordeaux mixture . . . is the safest and best one." My own experience has shown that the most serious cases of the rusting of apples have been in orchards treated with the Bordeaux mixture, prepared with the aid of the test, the applications having been made in orchards about Ithaca, and also in the western part of the state. At Ithaca we had orchards containing the same varieties for comparison, the one having been sprayed with Patrigeon's Bordeaux mixture, the other with that made according to a formula. No definite data can be given, but the impression received from the examination of the two orchards was unfavorable to the use of the test; so much so that a considerable excess of lime was added when the mixture was prepared the second time.

(3) The chemistry of the Bordeaux mixture, as now understood, indicates that more lime is necessary than the ferrocyanide of potassium test demands. Abundant experimentation has shown that the carbonic acid found in rain and dew exerts a solvent action upon the copper compounds found in the mixture whenever no excess of lime is present. In other words, the greater the excess of lime in the Bordeaux mixture, the more slowly will the copper compounds be dissolved, and, therefore, the smaller the excess the more quickly will the copper enter into solution. The solvent action of the water is greater where there is much dew or where the rainfall is more or less continuous. Light rains and a moist atmosphere will dissolve the copper most readily, and the solution will collect upon the foliage unless the rainfall is sufficiently violent to wash it off. Which form of the copper is most readily dissolved from the mixture is uncertain, but Willard has suggested that the solution contains considerable quantities of the sulphate of copper, a compound which is known to be caustic to foliage.† Such conditions very readily explain the injury done by the Bordeaux mixture in 1894, and also the increased injury following the adoption of Patrigeon's method of making it.

(4) The Bordeaux mixture is now frequently applied with Paris green or London purple. These poisons are unsafe to apply to the foliage of many plants unless lime is added to the liquid. But if the Bordeaux mixture does not contain an excess of lime, injury may follow the application of such a combination, especially in a wet season. When Patrigeon's method is recommended, special direction should be given for cases in which arsenites are to be used with the fungicide.

(5) A serious objection to relying upon the ferrocyanide test is the danger arising from its improper use. This was clearly shown in the article of Professor Beach on page 128 of the current volume of GARDEN AND FOREST. Serious injury may follow, and appears to have followed, from such mistakes. When a definite formula is employed there is less liability of error, and, to my knowledge, no preparation has proved itself safer, when the proper ingredients are used, than the formula given below.

Color tests possess a decided value in the preparation of the Bordeaux mixture, since they mark a certain stage in the preparation of the compound. The color of the mixture itself also shows the same. I have frequently made this fungicide without the aid of scales or of the ferrocyanide test, basing the amount of lime added upon the color of the mixture. The use of the test is safer, however, and if a sufficient excess of lime is added the preparation must be as effectual and as safe as if the ingredients had been weighed. But this excess of lime is an uncertain quantity, and as a general recommendation I should prefer six pounds of copper sulphate, four pounds of quicklime and forty to fifty gallons of water as the safest proportions. I have used the formula for three years, partly because the fungicide was used in experimental work and a definite compound was desired; in other cases the ferrocyanide test or the color test of the mixture served as a guide to the proper amount of lime. During this time I have not once strained either the lime or the Bordeaux mixture, since in making the application no trouble was experienced from the clogging of machinery. The McGowen nozzle has been used almost exclusively. With the Vermorel nozzle it may be advisable to strain the lime in the majority of cases, although not necessarily more because the latter is weighed. The weigh-

* Patrigeon, *Journal d'Agriculture*, Prat, 1890, May 15th, p. 701.

† Beach, Annual Report New York Agricultural Experiment Station, 1892, p. 539.

‡ New York Agricultural Experiment Station, 1894. June Bulletin 72, p. 346.

§ New York Agricultural Experiment Station, September Bulletin 74, p. 404.

|| New York Agricultural Experiment Station, 1894. September Bulletin 74, p. 404.

¶ Bordeaux Mixture as a Fungicide. U. S. Department of Agriculture, Division

Vegetable Pathology, 1894. Bulletin 6, p. 14.

* Cornell Agricultural Experiment Station, 1894. October Bulletin 74, p. 382.

† Cited by Fairchild, *Bordeaux Mixture as a Fungicide*, page 14.

ing of the lime certainly is a slight inconvenience, but has thus far not proved very objectionable.

Cornell University.

E. G. Loderan.

Notes.

Perhaps it ought to be stated that it is Professor Tuomey himself whose portrait is given with that of the Cactus on p. 155.

Professor Halsted writes that the late winter has been very trying upon the English Ivy which covers many of the older buildings in New Brunswick, New Jersey. The leaves are mostly brown, many of them dead and have the appearance of having been scorched by fire. It may be that the plants will revive with warm weather, but these old vines, which have been the pride of the city, are just now anything but attractive.

It is a well-known fact that many varieties of tree fruits which in the extreme north would perish in a hard winter if root-grafted, can be grown successfully if top-grafted on very hardy varieties. Dr. Hoskins finds that the Sops of Wine Apple is a common failure with him when root-grafted, but when grafted on the Peach Apple it endures the winters perfectly, and has borne profusely for many years, though here and there a limb has died and been removed.

Winter cabbage, which was very cheap until recently, now brings twenty cents a head, a price as high as that asked for new Florida cabbage. New string-beans cost thirty-five cents a quart, and \$1.25 a half-peck is asked for peas. Large bunches of asparagus bring fifty cents. Romaine lettuce from Bermuda costs fifteen cents, chervil ten cents for a small bunch and dandelion fifteen cents a quart. Small heads of hot-house cauliflower may be had for forty and fifty cents apiece, and cucumbers grown under glass cost eighteen cents each.

Professor Jordan, of the Maine Agricultural Experiment Station, has been making some tests which show the folly of growing the large southern Corn in the northern parts of the country to be cut for fodder or for ensilage. This tall-growing Dent Corn makes a great bulk, but the season is not long enough to allow it to ripen. When it is cut in an immature state analysis shows that the Maine Flint Corn, which matures perfectly, is worth more than the southern Corn, pound for pound, judging simply by the per cent. of dry matter. It is also shown that the quantity of dry matter in an acre of Corn at maturity was two and a half times greater than it was at the silk period thirty-seven days before, and that the starch and sugars, which are the most valuable compounds, increase more rapidly than the less important constituents, so that the mature plant is of better quality than at any previous stage of growth.

Owing to the universal observance of Holy Week in the West Indies no pineapples have been received here for almost a week, though nearly five thousand barrels are expected within the next few days. The ripening of this fruit in Cuba has been retarded by dry weather, and the crop is estimated to be twenty-five to thirty per cent. less than that of last season. Prices now are somewhat higher than a year ago, but it is expected will be considerably lower in a fortnight, when the season will be fairly opened. The stock of California Navel oranges of the choicest brands is about exhausted, and a carload of good fruit sold here at auction on Monday averaged at wholesale the high price of \$3.27 a box. Northern Spy and the brighter Ben Davis are the showiest apples now in our markets, and high grades of these command \$6.00 a barrel at wholesale. Strawberries are comparatively plentiful in supply, and well-ripened fruit of good size may be had for forty cents a quart.

When we think of the teeming population which now fills many portions of our country west of the Rocky Mountains, and remember how famous, all over the world, is their singular beauty, and their incomparable value to the tourist, the health-seeker, the agriculturist and the horticulturist, as well as the miner, it is interesting to read what so intelligent a statesman as Daniel Webster thought of them just fifty years ago, and to know that his views were shared by many other prominent public men of the time. In a speech delivered in the United States Senate in 1844, with regard to the proposal that a mail service should be established between Missouri and the Pacific coast, Webster said: "What do we want with this vast, worthless area, this region of savages and wild beasts, of deserts, of shifting sands and whirlwinds of dust, of cactus and prairie-dogs? To what use could we ever hope to put these great deserts, or these endless mountain ranges, impenetrable, and covered to their bases with eternal snow? What can we ever hope to do with the western coast, a coast of three thousand miles, rock-bound, cheerless and uninviting, with

not a harbor on it? What use have we for such a country? Mr. President, I will never vote one cent from the public treasury to place the Pacific coast one inch nearer Boston than it is to-day."

The tendency to use plants in flower for house and church decoration at Easter was stronger this year than ever, and was conspicuously manifested in the increased size of the specimens offered. Of course, there was a great array of Lilies, and plants were valued according to the number of flowers they carried, each flower being valued at twenty-five cents. Sometimes several bulbs had been grown in one receptacle, and these masses, when exceptionally well-flowered, often commanded, with the fancy baskets in which they stood, \$10.00. There were Dutch bulbous plants, Hyacinths, Tulips and Daffodils, in abundance; Violets and Cyclamens in pots, and Astilbe in great quantities, including some of the newer varieties under various names, all very beautiful, but none of them superior to the type, which, after all, has an airy grace which the more compactly flowered plants do not possess. Among many other shrubs forced into bloom, Hydrangeas, Cytisus and Azaleas were far the most numerous. Fine Hydrangeas, with ten or a dozen heads of flowers, often commanded \$10.00. Trim little well-flowered plants of Cytisus could be had for \$2.00, and larger ones, the price rapidly increasing with the size, cost \$30.00, and even \$50.00. Plants of this last grade had stems two inches in diameter and were six feet high and nearly as much across. The Azaleas sold for \$4.00 for well-flowered plants a foot across, to \$100 for densely flowered specimens five feet and more in diameter, and there is a story of an exceptionally large and well-flowered plant, some eight feet in diameter, which sold for \$500. Singularly beautiful plants of Acacia paradoxa commanded \$50.00. The clear yellow of these flowers and the deep green of the leaves made this altogether the most pleasing and showy of the yellow-flowering plants. Among the other flowering shrubs, specimens of the tree Paeony, Reine Elizabeth, were very effective. Our native Laurel, Kalmia latifolia, Andromeda speciosa and A. Japonica, Lilacs, Snowballs, Boronias, Metrosideros were more rarely seen, and the price for these varied according to their quality and size.

The fungus which spots the leaves of the Quince and produces the black spot on the fruit is nearly always present, and this is especially true when the trees are standing in sod. It is from the effect of this disease that the leaves of the Quince often begin to fall in August and in early September, while, of course, the foliage ought to persist until the fruit has ripened, for the loss of the leaves deprives the fruits of nourishment at the time when they are completing their growth. When the leaves die before their time the fruit remains small and immature. This defoliation also prevents the tree from storing up energy for the next year's crop. But not only is the fruit stunted before it is fully grown, but the fungus also attacks the fruit itself, causing cracks and lop-sided growth, as in the case of pears when attacked by the same fungus, *Entomosporium maculatum*. In a late bulletin on the Quince in western New York, Professor Bailey gives the results of experiments to show that this fungus can be held at bay by spraying with the useful Bordeaux mixture. On the 25th of June, last year, when the leaves in a Quince orchard had been already badly marked, this mixture was sprayed on so abundantly that all the foliage and limbs appeared deep blue when the application had dried. It was repeated on the 9th of July, when, although the disease did not appear to have progressed much, the foliage remained equally blighted in the sprayed and unsprayed portions of the orchard, and the fruit upon the sprayed portions was browned and discolored by the treatment. The experiments seemed so unpromising that nothing further was done, but on the 21st of September a visit to the orchard showed that the fruits on the sprayed rows were twice as large as those on the untreated rows. They were yellower, less fuzzy, uniform in size, and the russet discoloration had all gone. Half of the foliage had fallen from the unsprayed trees, and the remaining leaves were small and yellow. The foliage on the sprayed trees was large and dark green and plainly helping the growth of the fruit. Professor Bailey accounts for the fact that the sprayed fruits were less fuzzy than the other ones by supposing that this woolly covering, which is a living growth on the surface of the fruit, was killed by something in the application. The so-called moss, which is really one or more species of lichen which had overgrown the trunks of many trees, was also completely destroyed. Experience seems to show that the spread of the spot may be wholly checked, even after the leaves are conspicuously marked by it. Of course, it is unwise to wait until the disease appears, and the first application ought to be made soon after the blossoms fall.

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLES: —Magnolias as Garden Plants. (With figure.)	161
The Parkman Memorial	162
Forestry and the Abandoned Farm	Professor C. S. Plumb. 162
A Valuable Fruit-tree for the High North	C. V. Hartman. 162
Bull Pine in the West	Professor Charles A. Keffer. 163
PLANT NOTES:	164
CULTURAL DEPARTMENT: —Flower Garden Notes	E. O. Orpet. 166
A Few Desirable Plants	T. D. Hatfield. 167
The Earliest Daffodils	J. N. Gerard. 167
Christmas Roses	B. M. Watson. 167
Pot Bulbs for Early Spring	L. 167
Double English Primroses	E. O. Orpet. 167
Cyrtopodium punctatum	(1) 167
CORRESPONDENCE: —The Olive and the Lemon in Southern California,	Wm. M. Tisdale. 168
Notes from West Virginia	Danse Dandridge. 168
Some Hyacinths and Grape Hyacinths	J. N. Gerard. 169
RECENT PUBLICATIONS:	169
NOTES:	170
ILLUSTRATION: —Magnolia macrophylla, at Wellesley, Massachusetts, Fig. 26	165

Magnolias as Garden Plants.

THE illustration on page 165 of this issue, made from a photograph of a tree in Mr. Hunnewell's garden at Wellesley, in eastern Massachusetts, shows that this southern plant is capable of flourishing in regions of far greater cold than that which usually prevails in its native home. Of all the Magnolias, a genus celebrated for its large and handsome flowers and large leaves, this species produces the largest flowers and leaves, and the flowers and leaves of no other inhabitant of extra-tropical forests equal them in size.

Magnolia macrophylla is a stately tree, with horizontal wide-spreading branches, and in its native forests sometimes attains a height of fifty feet and produces a trunk eighteen or twenty inches in diameter. The leaves, which are clustered at the ends of the stout branches, are bright light green on the upper surface and silvery white on the lower, often thirty inches long and nine or ten inches broad, and form a splendid setting to the creamy-white fragrant flowers which, when fully expanded, are often twelve inches in diameter. Photographs or words cannot express the beauty of one of these trees when it is in bloom, or convey any idea of the solemnity of the great flowers, which one cannot contemplate without a feeling of reverence and awe and a sense of wonder that Nature in her wisdom and for some good purpose has placed in our forests of Oaks and Pines such a marvel of rich and gorgeous beauty.

Magnolia macrophylla belongs to a region of luxuriant and varied forest-growth, its home being at the base of the southern Alleghany Mountains, where it is distributed from western North Carolina and south-eastern Kentucky to middle and western Florida and southern Alabama, extending also through northern Mississippi and inhabiting central Arkansas. Known only in a few widely separated stations in the Atlantic states, this tree is more abundant west of the Alleghany Mountains, and seems to grow to its largest size in some sheltered limestone valleys of northern Alabama. Protection from the wind is essential to it, as its great delicate leaves are easily torn to pieces and de-

stroyed by the wind, and it is always found in small groves in forest-glades or little valleys, surrounded and often overshadowed by Swamp Chestnut Oaks, Dogwoods, Hickories and Gum-trees. It is a century since the elder Michaux, the French botanist and traveler who explored eastern North America under the auspices of the French Government, discovered this tree near the town of Charlotte, in North Carolina, but it has never been much cultivated or become very well known in gardens. That it is not more often seen in those of the northern states is certainly surprising, for, after its first years when young plants are better for a little protection, it is very hardy and begins to flower when only a few years old. In Europe, especially in England, Magnolia macrophylla feels the want of the hot summers and dry autumns of eastern America to ripen its wood, and, like many other North American trees, does not flower satisfactorily. This is true of most other Magnolias, which, as a general rule, are more satisfactory garden plants in the eastern United States and in China and Japan than in other parts of the world—a fact that is explained by the distribution of the genus which is now chiefly confined to eastern America and eastern Asia, although four species extend into the forests of the tropical eastern Himalaya.

Twenty Magnolias are known, although it is not improbable that others will yet be found in the almost unexplored forests that cover the mountains of south-western China, where trees of various genera abound and where one species of Magnolia is already known.

The Magnolias can be grouped into two sections. Those of the first section produce flowers before the appearance of the leaves, while in those of the second section the flowers do not open until after the leaves have grown to their full size. All the American Magnolias belong to the second of these sections, the species with precocious flowers being confined to Japan, China and India. To this section belong the Chinese Yulan Magnolia, Magnolia conspicua, and its various hybrids and varieties; Magnolia Kobus, a large tree of northern Japan; Magnolia salicifolia, of northern Hondo, a small shrubby tree with fragrant foliage, recently introduced into cultivation; the shrubby Magnolia stellata, and Magnolia Campbellii, of Sikkim, a stately tree with rose-colored or pink flowers. This tree, which, unfortunately, is not hardy in the northern states, has produced flowers in southern Ireland, and it may possibly thrive in our southern states, where its cultivation certainly should be attempted.

Of exotic species of the first section Magnolia hypoleuca is best worth cultivating in this country. It is a noble tree, growing sometimes in the forests of Yezo to a height of one hundred feet, with large leaves arranged in whorls at the ends of the branches, and large flowers with white sepals and petals, and prominent cones of bright red carpels. In foliage and flowers Magnolia hypoleuca resembles our American Magnolia tripetala, but it is a larger and handsomer tree and much harder in the northern states.

In the great evergreen Magnolia of the southern states the temperate countries of the world have the most beautiful evergreen tree known in gardens. With its smaller but more fragrant flowers and its lustrous leaves, deciduous at the north and persistent at the south, the Swamp Bay, Magnolia glauca, is an ornamental tree of peculiar charm and beauty. These two and Magnolia macrophylla are the most valuable of the American Magnolias among ornamental trees, but the other species have each their peculiar beauty, and Magnolia acuminata is also an important timber-tree.

We have desired, in writing these notes on Magnolias, to call attention to the fact that our climate is specially suited to the cultivation of these trees. All the American species, with the exception of the evergreen Magnolia of the south, are perfectly hardy as far north as eastern New England. Magnolia hypoleuca and Magnolia Kobus are apparently as hardy here as in their native forests of Yezo, and promise to grow here to a large size. Magnolia Watsoni and

Magnolia parviflora, of China, deciduous-leaved species with beautiful, fragrant, cup-shaped flowers, are both hardy here and delightful garden-plants; and all the precocious-flowered Yulan race grow and flourish here with as much freedom as in the gardens of China and Japan, spreading, when all deciduous-leaved trees are still bare of foliage, marvelous clouds of snowy white or purple bloom.

THE contributions to the Parkman memorial, of which we spoke last week, have already been so liberal that the success of the project is put beyond question. It is the desire of the committee, however, that as large a number of people as possible should be allowed to assist in this work. Francis Parkman inspired his readers with feelings akin to personal affection, and all who desire to manifest this sentiment of regard ought to be allowed to help in this commemorative work. Indeed, the committee have reached a point where they would prefer to receive the contribution of a single dollar, if it is given with enthusiasm and affection, rather than a much larger sum from one who subscribes simply to be in the fashion. We repeat that contributions of any amount can be sent to Mr. Henry L. Higginson, 44 State Street, Boston.

Forestry and the Abandoned Farm.

IN the "Descriptive Catalogue of Farms in Massachusetts, abandoned or partially abandoned," issued by the State Board of Agriculture, are descriptions of farms containing considerable land growing up to forests. The woodlands are referred to after this manner, in the list of descriptions of farms: "It is estimated that there are sixty tons of hemlock bark on the place." "Estimated that there are 200,000 feet of lumber on the place." "I think there is \$2,000 worth of wood and timber on the place, principally pine and hemlock." "It is estimated that there are over 2,000 cords of wood on the place."

Believing that in the future, perhaps in my own time, these cheap lands of New England may be valuable as timber preserves, if nothing more, I entered into correspondence with a person who advertised in the catalogue referred to, a property of 330 acres in Berkshire County, on which were 195 acres of woodland. I had simply a forestry investment in mind. Last November, therefore, having occasion to go to New England on other business, I took the opportunity to visit this farm, which is only about twenty-five miles from my birthplace.

The place was owned by a man who is now farming in Kansas. Seven years ago he suddenly packed up his goods and left his old home deserted, and went west. He was prosperous in New England, and left his buildings in good condition. Since then they have been untenanted. This farm was first offered for sale at \$1,200, and the price was gradually reduced to \$700, as no one would buy. There are two houses on it and three barns, one house and two barns being in fair condition. The buildings are located on the summit of a magnificent hill, with a very easy approach, from which is obtained a mountain view of great beauty. The buildings stand in the midst of a large amount of smooth meadow and pasture land. The many acres of grass land are unusually free of stone, and a mowing-machine can be used to advantage over it all.

Back from the pasture and tillable fields, surrounding the entire property, is the forest of various stages of growth. I spent the best part of a day tramping through the woodland and looking into its possibilities. The trees are mainly White Ash, Yellow Birch and Sugar Maple. There is also some Spruce and Hemlock. White Ash predominates, and many trees have a diameter of six inches. The latest clearing on the farm is growing up to Beech. Although not specified in the description, there was an additional wood lot of forty acres, and that was "thrown in" without increasing the price.

This farm of 361 acres, containing over 225 acres of woodland, I bought for \$700, about \$1.90 per acre, in-

cluding five buildings, three of which can be put in good repair with a slight expenditure of money. The woodland, however, was the main consideration. Though believing that this property might at least pay four per cent. on the investment, before buying I discussed the wisdom of such a purchase with two men who ought to be capable advisers. One of these is a well-known farmer in a Massachusetts town, and an old friend of mine, who has had large experience in woodland property in New Hampshire and Massachusetts. He expressed it as his opinion that such woodland would prove a good investment, and stated that he already had bought and was holding some 200 acres of just such property. His advice was to buy by all means. The other person with whom I consulted was the Chief of the Forestry Division of the United States Department of Agriculture, Mr. B. E. Farnow, and his opinion was also favorable to the purchase of the land. There is certainly no great risk involved, inasmuch as one can easily get nearly 1,000 cords of wood from the property now.

Here is a farm, within four miles at its nearest point of a station on the Boston and Albany Railroad, on a decent highway, with a fair set of buildings, with plenty of good arable land and excellent future timber resources, selling at a lower price than land can be bought for anywhere in the west to-day—and this in the very heart of civilization. The scenery gives spacious views of the character well known in Berkshire County. A beautiful mountain lake is only half a mile away. Lenox and Stockbridge are each less than fifteen miles distant.

Why has such a place lain vacant so long? So far as I can ascertain there are only two serious objections against this as a home. First, its isolation; secondly, the snows of winter. The post-office, church and railroad station are four and a half miles away, and it is a mile to the nearest neighbor and the school. In winter the snow accumulates to a great depth, and sometimes it is difficult to travel across country on account of the drifts.

But land can be bought here cheap, and it seems to me that this is a good time to buy these woodlands when so little invested will buy so much. Our forestry problems are receiving more and more attention. Schools of forestry will be established soon, and we shall have trained foresters in America. Notwithstanding the fact that cord wood is cheap in New England to-day, and the demand is weak in places, the value of American timber must increase rather than decrease in future years. It is my purpose to attempt a systematic handling of this woodland in order to ascertain whether an annual source of revenue cannot be derived from it. As New England was the part of our country first denuded of its forests it would seem appropriate that in this region the first attempt should be made to establish a forestry system. It is true that some forest-planting has been done on the sandy shores of Cape Cod, but the rocky hills of western Massachusetts also offer a good field for working out special forestry problems. The State Agricultural College of Massachusetts is already giving increased attention to forestry, and it is safe to assume that the time is not far distant when, with greater facilities for education in forestry, the woodlands of the state will be valued as a perennial source of revenue.

Purdue University, La Fayette, Ind.

C. S. Plumb.

A Valuable Fruit-tree for the High North.

VAST territories of the North American continent, such as Northern Canada, British Columbia and Alaska, comprising tracts as extensive as several European kingdoms, are outside of the geographical range of the common fruit-trees. No practical method has yet been proposed for the acclimatization of fruit-trees in the high north, and hitherto there has not been much prospect of the discovery of any new fruit-tree especially adapted for these cold regions.

Fortunately, we have a new fruit-tree now which is suited to the gardens of the icy north, a tree that is absolutely hardy and produces unfailing crops of delicious and

fine fruit. It is the first fruit-tree for the coming orchard of the high latitudes. I can write with much confidence about the tree because it has been tried for several seasons in the high latitudes of Europe above the limits of other hardy fruit-trees.

The tree is a form of the Mountain Ash, *Pyrus aucuparia*. The fruit, so far from being acid and rough, has a deliciously sweet-sourish taste, and is twice as large as that of the common type.

Ten years ago, I accidentally saw an account of this new fruit-tree in an Austrian horticultural paper, and in the belief that it would prove a desirable acquisition for the Scandinavian Peninsula, Finland and Russia, where the same cold climate prevails as in the northern countries of the New World, I drew the attention of the Director of the Horticultural Department of the Royal Swedish Academy of Agriculture, Mr. Erik Lindgren, to this valuable novelty and proposed its cultivation. The tree was introduced in Sweden in 1885, and has proved to be absolutely hardy, having ripened its fruit even as far north as Pitea in latitude 66° , where no other fruit-trees can be cultivated.

The home of this fruit-tree is the high mountain region of northern Machren, in Austria. The Mountain Ash is a characteristic tree of the mountains of Machren and also of Schleisen, and appears there in such masses that forests are formed of these trees. About ninety years ago, some boys who were watching cattle near the small village of Peterwald discovered that a certain Mountain Ash in the forest had unusually large and sweet fruit. A farmer, Christof Harmuth, who had some knowledge of horticulture, made an experiment and grafted this form upon a young wildling near his farm. When the grafted tree had grown up and produced fruit, he found, to his satisfaction, that it was even larger and better than that of the mother tree. New grafts from this improved form gave a still finer quality of fruit. The new fruit-tree soon became popular in the neighborhood of Peterwald, and trees were planted on nearly every farm. The climate of Peterwald is very cold. The altitude above the sea is nearly 2,300 feet. Oats and barley can be cultivated only in the valleys, but often before the harvest-time in September the oats are spoiled by the snow. At the altitude of 1,750 feet the common fruit-trees fail to give any regular crops, and at 2,000 feet only a kind of Cherry-tree, *Prunus Avium*, ripens its fruit. Strangely enough, "die süsse Eberesche," or the Sweet Mountain Ash, as the tree is called in Peterwald, has been confined to this small place until quite recently. The real importance of the new fruit was perceived by Mr. Franz Kroetzel in 1885, who described the tree and reported on it, with the result that the Minister of Agriculture paid special sums for two years for the propagation and spreading of the tree among the inhabitants of the high mountain regions of Austria.

In Sweden the tree has been largely distributed by Mr. Lindgren, who, in a report to the Swedish Academy of Agriculture, writes: "During 1892 several young trees of the Mountain Ash have produced plenty of fruit, and I have consequently had better opportunities than during previous years to try it. I consider this fruit-tree as very valuable, especially for the northern provinces, and it should be grown in every district. The fruit, when slightly touched by frost, has a delicious taste. Even persons that are rather particular in matters of taste find this fruit very good. The tree has also a more elegant appearance than the common form, and the wood ripens earlier in the autumn."

The Mountain Ash belongs as an indigenous tree to the very coldest regions of the world, and this variety is undoubtedly as hardy as the type. In Europe the Mountain Ash appears at the North Cape, on the coast of the Arctic Ocean, although there only as a shrub; it is also to be seen in Greenland and in America.

In the United States this fruit-tree will prove a valuable acquisition to many large mining towns in the high altitudes of the Rocky Mountains in Colorado, Nevada, etc. In the small gardens here, where only vegetables and

flowers are now grown, whole orchards may be planted. No improvement of the soil is needed for this fruit-tree, that deserves attention for use even as an ornamental park-tree. The light greenish tint of the leaves is always beautiful, and the white flowers in the spring, as well as the large clusters of brilliant red fruit in the fall, are very attractive. The fruit will serve for the same purpose as the expensive cranberries bought from the east. It can also be used as a preserve, in pies, etc. Served as a dessert fruit it is showy and attractive in glass, and it compares favorably with many other small fruits.

Through continued culture and careful selection, still finer varieties will undoubtedly be obtained from the present form, as has been the case with all other fruits.

The fruits of the Sweet Mountain Ash are almost pear-shaped; the leaves are larger than those of the common Swedish form, the segments longer and narrower.

Botanic Garden, Stockholm, Sweden.

C. V. Hartman.

Bull Pine in the West.

DURING the period of most rapid settlement of the states west of the Mississippi River, the only Pines offered in quantity by the nurserymen were the Scotch, Austrian and White Pines. Of these the two former have been found much better adapted to the greater part of Kansas, Nebraska and the Dakotas than the latter, but it is believed that the Rocky Mountain form of the Bull Pine, *Pinus ponderosa*, Douglas, will prove the most useful species of the genus for planting on the plains, because of its ability to withstand extreme drought. It is a distinctly western species, ranging from the Pacific coast, where it attains its greatest development in Washington and Oregon, to the valley of the Niobrara River, in Nebraska, and South Dakota. For cultivation in the Plains, seeds should be secured from trees on the eastern slopes of the Rocky Mountains, the western form of this, as of many other conifers, not being hardy on this side of the continental divide.

I was especially interested in this species as it grows along the Niobrara River (longitude about $99^{\circ} 45'$), and at Fort Robinson, in north-western Nebraska. Ten miles north of the town of Ainsworth, the Bull Pine is found on the slopes and crests of gulches which break from the high level of the prairie to the Niobrara valley. The soil is an extremely fine, light-colored clay sand, with numerous pockets of almost pure, rather coarse, sand. No rain had fallen for months, but in all the "pockets" facing north the soil is moist within two inches of the surface, even near the crest. The most vigorous trees are found in these pockets, but isolated specimens stand in the driest, most exposed southern slopes. The bottoms of the gulches are filled with deciduous trees, mostly Box Elder and Green Ash. The largest Pines seen were not more than eighteen inches in diameter breast-high, and the tallest tree found measured fifty-five feet high. The gulches are fenced for pasture, and no trees younger than five years were found. A very few Pines were growing on the level prairie, but these were near the crest of the gulch. This shows, however, that if protection from fire and stock could be had, the Bull Pine would seed the ground.

At Fort Robinson this Pine occupies the slopes and crests of the ridges, and even the high buttes, with precipitous sides, support a sturdy growth of the Pine on their tops. A careful examination of the timber reservation at Fort Robinson shows the urgent need of protection against stock and fire. The settlers in the vicinity are permitted to use the reservation as grazing-land. The higher slopes, rising 200 to 400 feet above the valley, are covered with widely spaced Bull Pines in sufficient numbers to insure complete seeding and a close stand if protection could be secured. The soil is a very dry sandy clay, with coarse gravel, and the herbage on the hills is scanty. The growth in this dry region is necessarily slow, and it is to be hoped the reservation, which was established to supply the adjoining fort with fuel, can be thoroughly protected, as it

affords a fine opportunity to test natural reforestation under unfavorable climatic conditions.

The Bull Pine was planted in the Sand Hill experiment referred to in the article on Banksian Pine, but a very poor stand was secured. At Franklin, Nebraska, on the south line of the state (longitude about ninety-nine degrees west), the Bull Pine has been more thoroughly tested than anywhere else in the west. Notwithstanding the unprecedented drought of the past two years in that region, this Pine is vigorous, far surpassing the Scotch and Austrian Pines. I measured two trees that were nine years from the seed which were over eight feet high. The growth of Scotch Pine is somewhat more rapid, but less vigorous. The soil at Franklin is the typical clay loam of the west, and success there, coupled with the northern range of the species, indicates its special fitness for forest purposes throughout, at least, the northern part of the plains.

Charles A. Keffer.

Washington, D. C.

Plant Notes.

DEUTZIA PARVIFLORA.—A correspondent writes that he has seen this plant recommended, but that he does not find it in the catalogues of some of the largest growers of ornamental shrubs. There is no reason why so good a plant should not be generally offered by nurserymen. *Deutzia parviflora* was figured in *GARDEN AND FOREST* as long ago as 1888, and at that time we stated that it had been cultivated for some years in the Arnold Arboretum, having been received from the St. Petersburg Garden. It is one of the most hardy and altogether desirable of Asiatic shrubs which will grow in this climate, and it is the most beautiful of the three or four *Deutzias* which are grown here. A glance at the picture of a flowering branch of this plant in vol. i., page 365, will show that it is altogether different in appearance from the other *Deutzias*. It grows to a height of four or five feet, making a compact bush with brownish yellow bark and dark green elliptical leaves. The flowers are borne in corymbs, and appear in this latitude the last of May or the first of June. They are pure white, and borne in such numbers that they quite cover the upper portions of the stems.

PUSCHKINIA SCILLOIDES, var. COMPACTA.—This charming little plant is now flowering in sheltered places. It is best described as a light blue striped Squill. The groundwork of the petals is white, a pale blue stripe running down the centre and sides of the segments of the perianth. The flowers are borne in spikes on stalks about six inches high, and open with the development of the leaves. In the type the flowers are few in number, but in this variety they are abundant. It is perfectly hardy, and should be planted in masses with Squills and the Chionodoxas. Like these plants, they should be allowed to grow in the same place for several years, at least, not being lifted until they become crowded. It is a native of eastern Europe and western Asia. *Puschkinia libarotica* is a synonym of the type, which is inferior in every way to the variety described.

SCILLA BIFOLIA.—This is one of the early-blooming Scillas or Squills, which is not so common here as *S. Sibirica*. It is a native of southern Europe, is perfectly hardy, and, although not so showy as the better-known *S. Sibirica*, is well worthy of a place in every garden where it is desirable to obtain variety. The flowers are of good size and abundant; they are deep blue, almost purple, and sometimes have a reddish tinge. The leaves appear with the flowers, and are generally two in number, hence the name. They should be planted in masses in well-drained soil in a sunny position, and not lifted and separated until this is necessary. The Dutch Yellow Crocus, now known as the Large Yellow Crocus, a variety of *C. aureus*, opens at the same time with *Scilla bifolia*; the two planted together make a pleasing contrast and a very bright spot in the garden in the cold spring-time.

CHIONODOXA GIGANTEA.—This *Chionodoxa* is of recent introduction. It is probably a variety of *C. Luciliae*, and is

sometimes offered under the name of *C. Luciliae*, var. *grandiflora*. It is, nevertheless, a most distinct plant, well known and recognized by gardeners and dealers in bulbs. The flowers are much larger than those of *C. Luciliae*, and borne on short nodding scapes, two or three in number. The color is a very pale delicate porcelain-blue, somewhat reminding one of the Hyacinth Czar Peter. It is certainly one of the best and most distinct of all the Glories of the Snow, and should be more commonly planted. It is perfectly hardy, and succeeds admirably if cultivated in the same way and in the same beds as ordinary *Chionodoxas* and Squills. It is in bloom now, but is a trifle later in flowering than *C. Luciliae*.

ANEMONE BLANDA.—This lovely little flower, one of the earliest of its class, and much earlier than its relative, our *Hepatica*, is an inhabitant of mountain regions in Syria, Greece and other parts of south-eastern Europe and of south-western Asia. Transplanted to American soil, it thrives remarkably well in suitable situations and is hardier than would be supposed, considering its natural habitat. It is a tuberous-rooted species, sending up slender, short stems three or four or more inches high, bearing much-divided leaves and solitary flowers. These blossoms, expanded, measure from an inch and a half to two inches across and are composed of numerous narrow petals, varying in color from deep blue or a purplish tint to almost white in the different varieties or forms. In mild weather these flowers open in February and March, quite as early as the better-known cheerful yellow-flowering Winter Aconite. The plant requires a good light, warm, well-drained soil, one composed of sand and loam being excellent; a warm sheltered situation or southern exposure, protected from other sides, is the best. A spot that is so hot and dry in summer that scarcely anything will live on it seems more suitable than a moist and richer one. The plants will thrive where there are only three or four inches of soil on top of solid rocks and which in summer often becomes dry and parched. As the leaves ripen and dry off early in the season the roots are dormant in the hot summer months. This species is perfectly hardy without protection in a climate like that at Boston, Massachusetts, where the mercury sometimes falls many degrees below zero of Fahrenheit. In the warm corner of a rockery, on the south side of a house close to the foundation-walls and in other similar situations it will thrive and take care of itself when once established and kept free from encroaching weeds and other plants. The tubers should be planted in the autumn a couple of inches deep. Their increase is usually slow.

HIPPEASTRUM VITTATA SUPERBA.—A remarkable specimen of this plant was exhibited by Mr. H. H. Hunnewell in Horticultural Hall, Boston, two years ago, for which Mr. Harris, his gardener, was awarded a silver medal. It is again in splendid bloom. This variety is one of the best of the older sorts, and enters into the parentage of a large percentage of recent kinds. Mr. Hunnewell's plant carries eighteen scapes almost two feet long, nearly all of which bear four flowers from five and a half to six inches in diameter. The name is due to the red and white stripes running lengthwise through to segments of the perianth. Hippeastrums, or Equestrian Star Lilies, have rapidly increased in popularity during late years. For some reason, until recent years, they have been very expensive and scarcely within the reach of persons of moderate means. There is little need to buy the high-priced varieties when seedlings can be raised so easily. In three places near Boston 600 seedlings were raised last year. The majority of these will probably bloom next winter. Hippeastrums need a resting season, though never to be thoroughly dry, and they flower mostly in April. Growth commences with some kinds early in the winter, and continues slowly. They force easily, and, although their natural season for flowering is April, they can easily be brought into bloom a month earlier.

BORONIA MEGASTIGMA.—This plant, which is now rather largely grown in London for house decoration, is only



Fig. 26.—*Magnolia macrophylla*, at Wellesley, Massachusetts.—See page 161.

found in a few private gardens in the United States, and commercial florists have not yet learned its value; or, perhaps, its rarity here is due to the supposed difficulty of cultivating hard-wooded Australian plants. This Boronia is a delicate-branched shrub with small leaves, divided into from three to five narrow rigid leaflets, and small axillary subglobose flowers, maroon color on the outer surface of the petals and yellow on the inner. The value of the plant is in the delicate and delightful fragrance of the flowers, a small specimen perfuming a whole house. Plants are usually propagated from cuttings of half-ripened wood, which must be carefully watered and shaded, as they are extremely sensitive to bright sunlight or excessive root or atmospheric moisture. Plants may also be raised from seed, which can be obtained from German or Australian seed dealers, large quantities being collected from wild plants in the Australian bush. The most successful cultivators here plant the young plants in the open ground in summer, but are careful to shade them with lath frames from the direct rays of the sun, and in winter grow them in a low temperature, bringing them gradually forward in greater heat when they are wanted to flower. They are planted out again during the second summer, and, after flowering again the following winter or spring, when the plants should be about two feet high and as much through, they are thrown away and replaced by younger specimens. A plant placed in an ordinary living-room when the flowers are opening should remain in good condition for two or three weeks, filling it with a delicate fragrant odor which is slightly pungent, like that of most other flowers of the Rue family, to which Boronia belongs. London florists find their profit in selling bushy well-flowered two-year-old plants for five shillings each, and in this country many people, if they once knew this Boronia, would gladly pay two or three times five shillings for equally good plants.

Cultural Department.

Flower Garden Notes.

THE unusually late spring makes garden work a week or two later than in ordinary seasons. Though planting cannot be done now, the preparation of the soil can go on, and when herbaceous plants show signs of activity changes can then be quickly made. The delay caused by the late spring enforces what has been advised before—that fall planting is always preferable for this class of plants, since in most cases one can judge better of the habits and height while the tops are on the plants. We find each year that some kinds will outdo themselves in vigor, and need to be moved further back, divided or thinned. If there is doubt now as to how the alterations should be carried out it is better to wait until another year, and make careful note during the growing period, so that the necessary changes may be made in the fall.

The planting of shrubs and conifers should be done now if they have already been lifted to prevent an early start of the buds. If this provision has been taken there need be no risk in planting until a month later. When planting is well done it is done for all time, and it is best to have the ground well dug at least eighteen inches deep. This can be accomplished by trenching or double digging the soil and mixing the manure well into the bottom, for if the roots are encouraged to go well down there is much less danger of injury from drought in hot weather; besides, trees and shrubs take hold more quickly and thrive better.

Magnolias should be planted in the spring. They are often difficult to establish, but when well started are among the best of flowering trees. It often happens that only small plants are obtainable, especially of the rare forms. It is well to grow these on in pots for a year until they are well rooted, and then transfer them to the places assigned to them. The soil should be good to a depth that will make future transplanting unnecessary, for Magnolias are the most impatient of root-disturbance of all our trees. Hot drying winds in exposed places make sad work with newly moved trees.

Young trees or conifers planted in rows to grow on for later use should be moved at least once in two years to insure a good number of young fibrous roots in a compact mass. Young stock grown in this way is worth twice as much as

stock that has not been transplanted, and if the room can be spared to shift them, the labor is not too great when the results are considered. We find that this biennial moving does not in the least interfere with the season's growth of evergreens. The check given to the growth of deciduous trees and shrubs benefits them by making well-balanced heads, with fewer strong shoots that have to be pruned out later on. Those who wish to add to their collections new and interesting novelties as they appear, realize the value of this reserve nursery, and know, also, that newly purchased or rare trees are often too small to plant at once in permanent positions. If these are allowed a year or two in a temporary place, so as to become acclimated and of larger size, an opportunity is meanwhile afforded to select the best place for their permanent planting, and the planting of a tree needs careful consideration with a view to its maturity.

A reserve border of herbaceous plants is also desirable, made up of kinds recently raised from seed, and which will not flower for a year or more; of duplicates, others that are on trial as to hardiness or desirability, and new and unknown sorts, as a lot recently raised here from seeds received from Asia Minor. These unfamiliar plants should be kept where they are not likely to be rooted out by those unfamiliar with their appearance when the borders are weeded. We have to mourn the loss of many plants in this way, but a straight row in the reserve border is comparatively free from this danger. Such a border is useful, too, to fill up losses.

Narcissi are coming on better this year than usual, and we shall soon be able to cut the first flowers from the borders. Hardy Narcissi are more useful than is generally supposed. They provide the first outdoor cut flowers; they have a strength and beauty all their own, and last much longer than those forced indoors, for the sorts that are best as hardy plants are too valuable to be grown for forcing. They have also more substance, with distinct contrasts in coloring. They are for the most part of garden origin, the result of the hybridist's skill, and not mere wild forms, although the wild forms have much to recommend them. The substance of Horsfieldii, Empress, Emperor, M. Foster, Henry Irving and Golden Spur constitutes the value these species have when cut for use indoors. The continued cold of the past winter seems to have suited the Narcissi well. There has been no early start, with succeeding chills, such as occurred a year ago, and the tops have none of the seared look that they took on then. A good display of flowers is promised soon, and a healthy growth of the bulbs afterward.

The newly introduced Spanish forms of Narcissi have disappeared almost to a bulb; they proved unsuited to our climate, while, as already stated, the garden hybrids have the best constitutions and multiply most quickly.

E. O. Orpet.

A Few Desirable Plants.

A REMARKABLY handsome specimen of the Crimson Rambler Rose is now in bloom in one of the greenhouses belonging to H. H. Hunnewell, Esq., Wellesley, Massachusetts. There can be no doubt that this Rose is a decided acquisition. It has been thoroughly tested during the long and severe winter just past, and it has come through in even better condition than the majority of hybrids. It appears to belong to the robust Japanese form of *Rosa multiflora*, and is harder than the Polyantha type. It is a Rose of exceptional value as a pot-plant, judging from the specimen grown here. It is trained in pyramidal form and is completely covered with handsome clusters of deep crimson flowers. Evidently the current season's bloom is produced on the previous year's growths, which now are rapidly stretching out and promise to attain five or six feet in length on an undeveloped specimen. Strong plants are said to form shoots from ten to twelve feet long. On a pot-plant these shoots will be far too rambling in character, and in order to keep the plants in convenient shape for handling, they will need a little training—say, into balloon, fan or pyramid form, according to the grower's fancy.

Another climbing Rose now competing for favor is the Dawson Rose (*R. multiflora*, var. *Japonica* × *General Jacqueminot*), raised by Mr. Jackson Dawson, of the Arnold Arboretum, Boston. The flowers are deep pink, almost red, borne in clusters, and a trifle larger than those of the Crimson Rambler, to which it will be a fitting companion.

A few days ago I saw a plant of *Muhlenbeckia complexa* used as a basket-plant in the conservatories belonging to F. Simpson, Esq., of Saxonville, Massachusetts. I observed many years ago a plant of *M. complexa* which grew along the house

of Mr. J. C. Niven, curator in the old Botanic Gardens at Hull, England. It was diffuse rather than climbing, and had to be tied up to prevent its getting into the driveway. It made a pleasing border, the long, black, slender, shining branches spreading in all directions. As a basket-plant it is unique. In the specimen seen in Mr. Simpson's conservatory the branches drooped gracefully, and on the maturer side of the stems were bunches of its peculiar glistening, wax-like flowers. In the centre of the flower is a black trigynous seed-capsule, characteristic of the Buckwheat family, to which it belongs. It is a native of New Zealand.

A little more than a year ago I made reference in GARDEN AND FOREST to a fine collection of some two hundred plants of the large-flowered Christmas Rose, *Helleborus niger maximus*, growing in a set of cold frames at Mr. Powers' place at South Framingham. These are now in full bloom and make a beautiful show. There can be no doubt that this is the most satisfactory way to grow these plants. When treated as perfectly hardy plants they are a failure, and even if they endure the winter they seldom bloom. As their natural blooming season is early winter, any flower-buds which move, as they will do during a spell of mild weather, will be sure to be killed. Very little protection has been given these plants of Mr. Powers. They have simply been kept from moving. The foliage is perfect and, being evergreen, it is essential that it should be preserved. Our plants, exposed on the rock garden, are cut down every year. Since no foliage holds over to sustain the plants when making their spring growth they simply go back more and more, making it only a question of a year or two when they will die out entirely.

Wellesley, Mass. *T. D. Hatfield.*

The Earliest Daffodils.

THE first Daffodils appeared during Easter week. Always welcome flowers these, yet with their appearance there comes the thought that the first flush of the resurrection of plant-life is passed, for these blossoms mark the beginning of a second season and the flowering of the more showy plants than those of the early year. Nature performs her operations on a grand scale, and sometimes rather noisily, but there are none of her changes more impressive than the annual awakening of plant-life. A rare sight is the awakening, when one considers how seldom it can be enjoyed during an ordinary lifetime. I think it has been said that if Nature would usher in the spring-time with a brass band or some such noise mankind would struggle with each other to behold the sight.

Narcissi do not flower in constant order in my garden; it is partly a matter of location as to when they open. *N. bicolor* and its variety, King Umberto, were the first this year, with Henry Irving second. There are others—*N. pallidus præcox*, *N. obvallaris* and *N. nanus*—in flower now. *N. nanus* is a pretty little dwarf variety with long trumpets, which should grow out of a carpet made by some low plant, or it might do well in grass. The minute *N. triandrus* has established itself in the grass on one of my borders, and has not lately failed to flower.

Elizabeth, N. J. *J. N. Gerard.*

Christmas Roses.

HELLEBORUS NIGER is the oldest and best known Christmas Rose, but several other species and many garden hybrids and varieties are now cultivated under this common name. *H. niger* and its nearest allies bloom in late November and December in favorable seasons, but if there is much dull and cold weather then, as there generally is, the flowering is deferred until spring. It is also true that, even after a fairly good autumnal and early winter bloom, many buds are left which will open in early spring; this is most likely to occur with old and well-established plants. Altogether it is quite fair, in the average New England season, to count the black Hellebores among our early spring-blooming plants. Several fine specimens of the type and its progeny are just now passing out of flower. They are not easy plants to establish—just why it is difficult to tell; it is probable that the trouble comes from our hot and dry summer weather. The plants are received from foreign nurseries in December. They should be planted in pots of moderate size and kept in a cool greenhouse during winter; here, if well grown, they will flower. The growth begins after flowering and continues into late spring and early summer; while growing they require plenty of water and a partially shaded position. After growth stops they should be plunged out-of-doors for the summer, still kept shaded during the middle of the day and well supplied with water. With

this treatment they make excellent plants for forcing, giving abundant flowers during November, December or January, in a cool greenhouse, pit or frame. This method of handling, too, seems to be the best to secure good plants for the open ground—that is, they arrive too late in the season for fall planting, but by growing them a year in pots good specimens are procured, which can be planted in September or early October. In this way a larger proportion are likely to live and continue in satisfactory condition. They should be given good soil, a partly shady place, and kept well watered in July and August; a rock-work, with a northern exposure, is by no means a bad position. Almost all the garden varieties are good, and give many shades in color, from pure white to dull purplish red; none of the reds are very bright. Propagation is effected by division and by seeds; both these methods present difficulties not easily overcome by the amateur; it is best to import plants or to procure newly imported plants from the dealers.

Jamaica Plain, Mass.

B. M. Watson.

Pot Bulbs for Early Spring.

EARLY TULIPS FOR FORCING.—It was once held that only the early Tulips were suitable for forcing, but with me the Bizarres and Byblcemens have proved well adapted to pot-culture. There can be no question that the later ones, with their long flower-stalks and large cup-like flowers, are much the most effective as pot-plants. A little weak manure-water applied once a week after the buds show induces even larger and finer flowers than are borne on garden-grown plants, while the characteristic feathering and flaking, that in the later Tulips reaches perfection, make them especially beautiful.

IXIAS.—These plants, together with their allied companions, Sparaxis and Babianas, are also admirable for late winter and early spring flowers. Desirable as they are for lengthening out the nearly spent season of bloom under glass, there is considerable complaint that they are too uncertain in flowering to be satisfactory. The foliage often turns sickly and yellow, and frequently the plants do not show a single bloom. I am inclined to think that haste in forcing is the cause of three-fourths of these failures. A judicious letting-alone during the first few months of their growth is wholesome for them. Under the benches or beneath a flower-shelf, where they have fairly good light, but not enough to stimulate rapid expansion, is a suitable place through early and midwinter. Then, as the season of their flowering draws near they need to be brought to the light and watered more freely than before. Under this treatment they always give fine flowers and plenty of them.

Pineville, Mo.

L.

DOUBLE ENGLISH PRIMROSES.—For several years we have grown in the cold frames a few sashes of these flowers for early use in spring, and have been much pleased with them. Bunched like Violets with their own foliage, they are among the most beautiful of early flowers, and would, doubtless, prove almost hardy in sheltered places, though as yet we have not tried them. There are a number of varieties of double Primrose, but these are not to be classed with the Polyanthus, the former having but one flower on a stem, and these double varieties cannot be raised from seed as can the single kinds, but are easily increased in autumn by division. There are many double kinds cultivated in English gardens, all of which would be appreciated here if better known. Hitherto we have only grown the double white, but there are as many as ten or twelve kinds altogether, most of them of very old garden origin, especially the old double Velvet Crimson, which was almost lost to cultivation until recently. The treatment that suits the common single varieties of Polyanthus in summer will also suit the double Primroses. They need a moist shady place in the hot months, division in September in good soil, and protection in winter. If put in a dry place in summer the plants are liable to be a prey to red spider.

South Lancaster, Mass.

E. O. Orpet.

CYRTOPODIUM PUNCTATUM.—This is one of the most useful of the Orchids now in bloom, and it is so easily managed that no one need hesitate to undertake its culture. Fibrous loam, well-rotted manure and rough sand suit it exactly. The flower-stalks are from two to two and a half feet high, with large panicles of yellow flowers spotted with brown. The flower-spikes and the new pseudo-bulbs begin growth simultaneously. In the fall, after the growths have become thoroughly ripe, the plants should be allowed to rest until they show signs of activity in the early spring. While making growth the plants are much benefited by frequent doses of weak liquid-manure.

Washington, D. C.

O.

Correspondence.

The Olive and the Lemon in Southern California.

To the Editor of GARDEN AND FOREST:

Sir,—In California's rapid development of fruit-production during the past ten years, two articles of great and growing consumption have been, until recently, almost entirely neglected. These are the olive and the lemon. Their history aptly illustrates the steps by which experience teaches the horticulturist in a new country the way to a profitable market. It shows, also, that the mass of men who engage in fruit-growing in such a country as California are unenterprising imitators, and that the few who have the courage and the skill to venture into a new field frequently reap almost incredible rewards before their monopoly is disturbed by their slower and less original rivals.

For a long time Mr. G. W. Garcelon, of Riverside, made a small fortune every year from lemons, while other growers made nothing. His lemons were fine, even-sized, well-colored, juicy, salable fruit. Other growers produced only a coarse, half-cured, worthless article. Mr. Garcelon sold most of his annual crop in San Francisco, frequently receiving five dollars a box. As from five to ten boxes to the tree is by no means an extraordinary yield, and seventy trees to the acre is a moderate planting, it is clear that his profits were very large. He was supposed to possess some secret and potent process of curing. Individuals and the state tried for a long time, without avail, to buy this secret, offering large sums for it. Two or three years ago Mr. Garcelon voluntarily divulged it for the good of the country, and since then more Lemon-trees have been planted than in all the years before. The secret proved to be only a very careful process of selecting, picking and handling the fruit and curing it at an even temperature and very slowly. The lemons remain in the curing-room from six to ten months.

The history of the olive was similar. The Messrs. Kimball, at National City, near San Diego, and Mr. Elwood Cooper, at Santa Barbara, realized great profits from olives. They sold the oil at from one dollar to two dollars per quart bottle. The output of Mr. Cooper's orchard of one hundred acres was, in 1891, 34,000 bottles. Yet, notwithstanding these reassuring facts, the ratio of lemons to California's entire orchard acreage, in 1892, was only one in forty. That of olives was even less, being one in fifty. This ratio has been somewhat increased by the plantings since 1892. The ratio of oranges, on the other hand, was three in twenty, a proportion which has decreased since 1892.

The Lemon is a more tender tree than the Orange, and more susceptible to injury from frost. For this reason sheltered, sunny locations must be sought for it. About San Diego there are thousands of acres of mesa and valley lands which are practically frostless. Many acres of these have recently been planted to Lemons and Olives, and more would have been planted had there been an adequate water-supply assured. San Diego has progressed so far in this direction that it has announced for this month the first Lemon Fair in the history of the state. At this fair the results achieved by the growers of San Diego County will be shown, and the latest methods of curing the fruit will be illustrated. For this purpose, certain enterprising growers have visited the lemon-growing districts of the Mediterranean, and have studied the curing methods in vogue there, which will be compared with home methods. Next to San Diego County, the Ojai Valley and other districts in Ventura and Santa Barbara Counties, Pomona, in Los Angeles County, and portions of San Bernardino County have been the principal centers of the increase in olive and lemon growing. In the production of olives they have gone ahead of San Diego.

The Lemon is, in a sense, a perennial bearer. The flowers and the green and ripening fruit are all seen upon the tree at the same time. The same statement has frequently but falsely been made in reference to the Orange-tree. The principal blossoming of the Lemon-tree, however, is in May, and the fruit is ready for picking in November. It is now usually kept in curing-rooms until the warm weather of the following summer creates a market for it. In this respect, again, the Lemon differs from the Orange, for the latter tree requires nearly a year to mature its fruit. The principal varieties grown in California are the Lisbon, the Eureka and the Villa-franca, each of which has its advocates. The industry is yet in its infancy. Its present status is illustrated by the results from seventy trees owned by one of my friends, whose trees are seven years old. They bore last year a crop averaging five boxes to the tree, and the crop was sold at \$1.15 per box,

on the tree. This fruit was purchased by dealers from San Diego, who shipped it to that city to be cured there for shipment east. For the year ending with June, 1894, lemons to the value of \$4,285,000 were imported into the United States. As compared with this total, the California product was an infinitesimal quantity.

A great many varieties of Olives have been tried in California, but the Mission, brought to the country by the Catholic Padres more than a century ago, still holds the lead. It is much smaller than the imported Queen olive, and it is permitted to become nearly ripe before it is picked. Its flavor is very different from that of the Queen, and at first is not usually relished as well. One soon acquires a taste for it, however, and in the local markets it is rapidly driving out the imported article. These olives have brought, at wholesale, this season, from sixty to eighty cents a gallon. It is very difficult to estimate the average product, but sixty gallons to the tree is not unusual in mature orchards.

The production of oil from the olive, whether on a large or small scale, is a very simple and inexpensive process. The essentials are a press of some sort, the more powerful the better, and great attention to cleanliness. The question of consumption of olive oil is largely influenced by the numerous adulterations upon the market, which are very extensively used. On account of their cheapness even druggists employ them in the preparation of prescriptions. Recent state legislation to prevent the sale of these imitations was easily evaded by the dealers who labeled their wares salad oil. The taste of the average consumer has been vitiated in this respect as in everything else, and many prefer a half peanut or cotton-seed oil to the pure olive. The hygienic value of the latter is very great, and its increased use in the kitchen in the place of fat compounds, would undoubtedly lessen the prevalence of dyspepsia. Besides, as an article of diet it is clean and refined. If these truths could be impressed upon the American people, there would be a market for all the olives and olive oil that California could possibly produce. As the case stands to-day, the question of profit from olives is disputed. "Plant olives for your grandchildren" is an Italian proverb frequently quoted in California. Yet, instances of an average production of fifty pounds from five-year-old trees, grown entirely without irrigation, have recently been reported. From such instances some growers argue that the Olive will grow upon any kind of soil and with but little care. Others claim that it needs good soil and plenty of water and attention, and that its slowness in coming into full production makes a heavy drain upon the purse, and doubtless the latter view is the safer, all things considered. Yet, when full grown, the Olive is a very beautiful, hardy, long-lived and productive tree, and an orchard of such trees would be no mean inheritance for anybody's grandchildren.

Redlands, Calif.

Wm. M. Tisdale.

Notes from West Virginia.

To the Editor of GARDEN AND FOREST:

Sir,—Nothing that blooms at this season of the year is more beautiful than the flowering fruit-trees. At Rose Brake these are freely planted for ornament; here, a group of Flowering Apples; there, Wild Cherries and the Japanese varieties; over yonder, a mass of Chinese and Japanese Cydonias, while close to the house are planted Apricots, Nectarines and Hard-shell Almonds.

But, perhaps, the most beautiful group is composed of Flowering Peaches. The variety that is employed has large double blossoms of a rich carmine color. These bloom late in April or early in May. The Apricots, Nectarines and Almonds, planted for ornament and to form a screen for some outbuildings, are especially valuable because of their early bloom. The Almonds are the first to flower, and then follow the Apricots, Nectarines and Plums.

The pleasure-grounds during late April and May are thus adorned with very many trees in bloom, and the effect of so many fine groups is very beautiful. We prefer, for the most part, to keep each class of plants by itself. Thus the different varieties of Lilacs are all together in one shrubbery, and our Magnolias have a choice place apart.

In the group of Flowering Plums we have *Prunus Pissardii*, *P. Simonii* and *P. spinosa*, and several other varieties. Of these the Chinese Double-flowering Plum is the last to bloom in company with the dwarf Flowering Almonds, which it slightly resembles.

Of all these charming trees, perhaps, our favorite is the Japanese Weeping Cherry. It is so graceful in habit of growth, picturesquely irregular at the same time, that it is symmetrical, but not tamely so. It is unique among trees, and I do not

wonder that it is the favorite weeping tree of Japan. Our single specimen is about fifteen feet in height, and is now covered with buds of a fine shade of deep carmine, which a day of warm sunshine will develop into delicate pink bloom.

In a wild portion of the grounds ledges of limestone rock adorn the sides and crown the summit of a little hill, and here many Red Cedars have sprung up of their own accord. These form a beautiful background for the large-flowering Dogwood, *Cornus florida*, and Red Bud, associated so generally in our woods against just such a dark screen of evergreen foliage, and surrounded, as here, by Columbine and lichen-covered rocks. This is our natural rockery, and here we think cultivated plants would be out of place. This is the spot for Ferns and our native wild flowers, such as Blood-root, Twin-leaf, Hepaticas, Anemones, Dicentras and Violets. These are all now in bloom. The only flower not found in our neighborhood, which has here a place, is the single white, fragrant, English Violet, and this is very charming, naturalized in the grass, where it grows and increases rapidly.

Following upon three early springs, this April of 1895 seems abnormally late, but is not really so. For a number of years I have noted the time of flowering of many plants at Rose Brake. To take, for instance, the Forsythias, I find in my notebook, that they began to open their golden bells in 1888 on the 17th of April; in 1889 they commenced to bloom on the 16th; in 1890 they bloomed on the 14th of April; in 1891 they were beginning to flower on the 15th; in 1892 I found their first flowers on the 8th; in 1893 on the 7th, and in 1894, that exceptional and treacherous spring, they were in full bloom by the 24th of March! This year a few buds opened on the 13th of April. At the date of this article, which is the 17th, they are not yet in full bloom.

Chimonanthus fragrans is the first shrub to flower in our garden. Only one bud on a bush about three feet high survived the terrible cold of the past winter. One solitary bloom opened early in March. This is with us the first fragrant flower of the opening year. Almost all the earliest flowers are scentless, such as *Jasminum nudiflorum*, the Forsythias and many bulbs. But Violets, Hyacinths and fragrant *Narcissus* follow quickly in their train. However, the earliest *Narcissus* that blooms here is scentless, and is a few days in advance of the fragrant varieties. I think it is *N. princeps*, and it blooms a little later than the first Crocuses and Snowdrops. *Chionodoxa luciliae* is now at its best, and so are many Hyacinths. Peaches are venturing a few blossoms in this neighborhood, but the nights are still cold, and we are not beyond the danger of heavy frost.

Rose Brake, W. Va.

Danske Dandridge.

Some Hyacinths and Grape Hyacinths.

To the Editor of GARDEN AND FOREST:

Sir,—It may help some of your readers to identify the plant described in GARDEN AND FOREST for April 10th as *Hyacinthus ciliatus* (*Muscari azureum*), if they are reminded that it is more commonly known in gardens as *Hyacinthus azureus*. It was first described by Baker as *Muscari lingulatum*, under which name it has been previously described in GARDEN AND FOREST. It has the habit of *Muscari*, with the campanulate flowers of the Hyacinth, and is evidently one of the hybrids common in the Lily family, and Baker, in the *Journal of the Linnaean Society*, vol. ii., page 427, named it *H. azureus*. It was figured with a colored plate in *The Garden*, August 10th, 1889. It has been collected in the Caramanian and Cilician Taurus, and is sometimes offered in trade-lists as *Muscari azureum* (Fenzl.). While its effect is that of a rich azure blue Grape Hyacinth, a slight examination will show that the individual flowers are dissimilar. It flowers here with the second early Snowdrops, and is valuable for its earliness as well as its rare color. It usually produces seeds, and with these and offsets a stock should be worked up to form a good colony, as it will require a few score of plants to secure a good effect in the border.

There is a beautiful blue *Muscari*, *M. Scovitzianum*, which will not flower for several weeks, which is rather prettier than *Hyacinthus ciliatus*. It has a larger flowering spike, and the flowers are light blue of the purest, daintiest shade. A collection of Grape Hyacinths should always include the white variety of *M. botryoides*, which now commences to expand its grape-like flowers. It is difficult to separate the purple *Muscari*. A variety from the Taurus, which has been established here a few years, is very vigorous usually, and is an intense purple, shading to a lighter color at the top of spike. It is generally a February bloomer, but this season has flowered late and is much smaller than usual.

Hyacinthus amethystinus scarcely flowers until June. Its small bell-like flowers are borne sparsely on graceful scapes about three inches long. They are of a light amethyst-blue. This is altogether a most charming plant. From Mr. Whittall a few years ago came a few stray bulbs of *H. lineatus*. This seems to be the smallest member of the family. It has two lanceolate leaves, two to three inches long, and a short scape with a raceme of small blue flowers. A dainty plant for a rockery, it would be easily lost in an ordinary garden. It flowers in June.

Elizabeth, N.J.

J. N. Gerard.

Recent Publications.

The Land Birds and Game Birds of New England, with descriptions of the birds, their nests and eggs, their habits and notes, with illustrations. By H. D. Minot. Second edition, edited by William Brewster. Houghton, Mifflin & Co. 1895. 8vo.

The new edition of Minot's *Land and Game Birds of New England* cannot fail to receive a warm welcome from all students of our birds. The original edition appeared in 1877. Considered as the work of a lad of seventeen, it may fairly be called a remarkable production. Although showing at times immaturity of judgment, its value as a record of original field observation was generally recognized at the time of its appearance, and the appreciation of its merits in this regard has, perhaps, increased with the lapse of time. The character of the work is in the main careful and accurate, and no small skill is frequently shown in conveying the delicate impressions received from out-of-door study. The truth of a passage like the following must be felt by every bird-lover accustomed to afternoon walks in winter:

From my acquaintance with the Tree Sparrows, I have almost involuntarily learned to associate them with a winter's afternoon drawing to its close, a clear sunset, with, perhaps, dark clouds above, and a rising north-west wind which sweeps across the fields to warn us of to-morrow's cold. The almost mournful chirp of these birds, as they fly to their nightly rest, has always seemed to me a fitting accompaniment for such a scene.

A second edition was always contemplated by the author, and after his untimely death the preparation of it was intrusted to our most accomplished field ornithologist, Mr. William Brewster, who has brought to his task the good taste and ripe judgment that have made his editorial work a model of its kind. The original form of the text has been carefully preserved, and embodied in the notes the reader is put in possession of much information as to the general distribution of the birds treated of, together with such additional knowledge of their habits, notes, etc., as has been acquired since the time when the book was written. Such annotations must ensure for the work a fresh career of usefulness.

The book is handsomely printed. It is prefixed by an excellent portrait of the author, together with a simple but touching biographical notice by his father, and a judicious introduction by the editor.

Notes.

Among the plants in flower for Easter decoration in this city were a few examples of *Dicentra spectabilis*, and very graceful they were.

We have received from Mr. George Hanson, Jackson, California, some flowers of the beautiful yellow *Calochortus Benthami*, showing that on the foot-hills of the Sierras the flowering season is much in advance of ours, as here the leaves of these plants are just appearing.

During the months of May and June a series of lectures and field-meetings will be conducted at the Arnold Arboretum by Mr. J. G. Jack, for the purpose of giving popular instruction concerning the trees and shrubs which grow in New England. The instruction given is not technical, and a knowledge of descriptive botany is not essential for students. Their purpose is to indicate by comparison the easiest means of distinguishing common native trees and shrubs and of recognizing foreign species. The different species and groups will be studied

as they come into flower, and the ornamental and useful properties, as well as their habits of growth and other peculiarities, will be considered. Any person who desires further information in regard to these lectures may address Mr. J. G. Jack, Jamaica Plain, Massachusetts.

Mr. Joseph Meehan writes from Germantown, under date of April 17th, that the conifers there have, as a rule, suffered very little by the hard winter, the exception being the Hemlock Spruce, which is terribly browned, *Cephalotaxus* and many of the Yews, which are scorched. Deodar Cedars lost a few leaves on their upper branches, but they are already budding out freely to the very tips of their shoots. The Cedar of Lebanon is also quite unhurt. In sunny places *Forsythia suspensa* was in full bloom, and so was *Magnolia stellata*. The early-flowering Bush Honeysuckles, *Cornus mas* and *Daphne Mezereum*, are everywhere in flower.

It is well known that the common evergreen Live Oak, of California, *Quercus agrifolia*, is preyed upon in the neighborhood of San Francisco Bay by caterpillars of the California Processionary Moth, *Clisiocampa californica*, which often devour the leaves once and sometimes twice during the summer and have given many of the trees an abnormal mushroom-like shape by stunting their growth. Professor E. W. Hilgard, of the University of California, calls our attention in a private letter to the fact that the caterpillars of another moth, *Phrygandia californica*, which also devour the leaves of *Quercus agrifolia*, are defoliating the plants of the European Oak planted at Berkeley, although they do not often attack the California White Oak, *Q. lobata*, which is botanically closely related to the European species. Curiously enough, horses and cattle never browse on the foliage of the California White Oak, although the branches of this tree, which are pendent and often sweep the ground, are very accessible to them, but they will stand on their hind feet to devour the young shoots of the European species.

Some interesting investigations have been made at the South Dakota Experiment Station on the distribution of weed-seeds by winter winds. For example, the contents of snow-drift on plowed land two feet square, three inches deep and ten rods from any standing weeds, were melted, and thirty-two weed-seeds belonging to nine species were found in it. Other tests confirm the fact that seeds are carried great distances upon the snow. Another test was made by pouring half-bushel piles of oats and millet upon the snow-crust when the wind was fifteen miles an hour. Both millet and oats passed a point twenty rods from where they had been placed in forty seconds. A twenty-five-mile wind was found to drift wheat-grains thirty rods in a minute. Of course, when winds on the plains keep blowing in one direction for days, seeds will travel many miles. The moral of these investigations seems to be that in the great western plains, at least, bare summer fallowing and matured weeds in waste ground may help to scatter seed during the winter over great areas, and they will be buried in the soil when the snow melts.

In the April issue of *The Botanical Magazine* a plate is devoted to *Magnolia parviflora*, one of the species introduced into this country nearly a quarter of a century ago by the late Thomas Hogg, and largely propagated at the Parsons' Nursery at Flushing, but apparently only recently known in Europe. It is said in the description which accompanies the plate to be a native of the alpine regions of the Japanese Island of Nippon, or, as the Japanese usually call it, Hondo, where it is said to grow on the Hakone Mountains, on Hego-San, and at the foot of the volcano of Wunyen, the two last being localities we do not find in the gazetteers or in Mr. Chamberlain's excellent *Guide Book of Japan*. The best Japanese botanists, however, who have in recent years carefully explored the forests of Hondo do not believe that this is a Japanese plant, but, like *M. conspicua*, *M. Watsoni* and many other plants which they only know in gardens, that it was introduced from China, which, at the time of the introduction of the Buddhist religion, sent to Japan most of the plants which they had been cultivating in their gardens for nearly a thousand years.

There is but a small amount of wood in a broom, but so many millions of these implements are used every year that the consumption of wood for broom-handles is a considerable item. *The Southern Lumberman* states that while it would have been almost impossible to sell a broom-handle made of heavy hardwood a few years ago, at present the reverse is true. The manufacturer prefers hardwood because it does not require so large a bolt, can be turned down smaller and yet retain sufficient strength, and can be ornamented more cheaply and artistically. Brooms with hardwood handles sell more

readily and do not deteriorate in appearance like the soft wood handles. Any kind of inexpensive hardwood, such as Beech, Birch, Maple or Ash, makes acceptable handles, while springy woods like the Elms are not salable, because one essential feature of a good broom is a straight handle. The manufacture of broom-handles can only be made profitable when the timber runs largely clear. In the eastern states the timber waste in making broom-handles exceeds fifty per cent., while in the south-west it is usually less than twenty-five per cent. There are four factories in Amsterdam, New York, one of which has a capacity of 1,200 finished brooms a day. They use hardwood handles from the south and west and get them for less than the bolts ready for the lathe can be furnished from native hardwood. The handles are turned green and dried afterward. The large end on which the brush is wired must be thoroughly dry or the broom will work loose. The drying of the upper part of the handle is of less consequence, except in the saving of freight.

Strawberries from Florida are scarce enough to make prices high, and the best fruit, which is coming from the vicinity of Lawtey, in that state, sold on Monday for sixty cents a quart. A few strawberries have already been received from as far north as Charleston. Mediterranean oranges are advancing in price, but much of this fruit is still coming at a loss. Altogether, 110,000 boxes of Sicily oranges and lemons were sold here during last week. Some California mandarins, small, but of good flavor and quality, bring twenty-five cents a dozen, and grape fruit from Jamaica costs ten to twenty-five cents apiece. Fully 50,000 bunches of bananas were disposed of last week at auction at high prices. Six cases of grapes from the Cape of Good Hope, via England, were sold here last Wednesday; while they arrived overripe and not in the best condition for want of proper packing, the experiment will again be made next season. Nectarines and grapes from South Africa reach England in perfect order, and peaches from the same remote place have been sold in this city in midwinter at \$3.00 each. Above 150,000 bushels of Australian and Tasmanian apples have been imported into England this year, the season continuing for six weeks from the first of March. The fruit is shipped in cases containing one bushel. The original cost of these apples is eighty-seven cents to a dollar a bushel, the freight for transportation covering 12,000 miles is \$1.00 more, and, with other expenses added the fruit stands at \$2.12 to \$2.25 a case when offered to wholesale buyers in the English market. With American apples, these are considered the best apples imported into England. The American export season for apples is almost ended, and above 1,440,000 barrels have left this country for Europe since last August.

Although the Japanese Anemone was introduced into European gardens fifty years ago, and the famous white sport from its variety, *Elegans*, known as Honoreine Jobert, was disseminated as long ago as 1863, there have been few variations from these old forms, owing to the fact that the plant, as we know it, rarely, if ever, produces fertile seed. Mr. Emile Lemoine, in an interesting letter to *The Garden*, once more invites attention to the fact that the variety Lady Ardilaun is a true seedling. This plant was raised by Mr. Campbell, gardener to Lady Ardilaun, who, nine or ten years ago, observed a head of seed on a plant of the white-flowered *A. Japonica*. This seed was sown, and of the three seedlings thus produced one was conspicuously better than the others, having pure white flowers of great size and substance, a taller growth than Honoreine Jobert, thicker stems and larger leathery leaves. A remarkable thing about this variety, which was called Lady Ardilaun, is that it produces seed which ripens readily in the open air. Mr. Lemoine sent out a seedling of this plant last year, which bore a semi-double flower at the same time that the American Anemone, Whirlwind, was sent out. He has other seedlings now under observation, and since this sudden change in the habit of the plant—that is, since it has become fertile and seed-bearing—we may, without doubt, look forward to a great many new varieties, single, double and semi-double. Mr. Lemoine describes a plant exhibited last autumn with stems as thick as a lead-pencil, perpendicular, and bearing numerous flowers which stand erect on firm foot-stalks. These flowers are formed of three or four rows of undulated and hooded petals, looking like little cups. Sometimes there are sixty of these petals in a single flower. The color of the flower is creamy white, passing into pure white, and it is three and three-quarter inches in diameter. Of course, where forms are constantly changing we may look for some improvements, although it would be difficult to imagine any flower which can excel in purity of color and grace of bearing the white-flowered Japanese Anemone as we know it.

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TABLE OF CONTENTS.

EDITORIAL ARTICLE:—The Metropolitan Parks of Boston.....	PAGE.
Notes upon Poisonous Plants	Professor Byron D. Halsted.....
Four Native Trees in the North-west	L. C. Corbett.....
FOREIGN CORRESPONDENCE:—Hippeastrums in England.....	George Nicholson.....
NEW OR LITTLE-KNOWN PLANTS:—Rose, Belle Siebrecht. (With figure.).....	
PLANT NOTES.....	
CULTURAL DEPARTMENT:—Spring-flowering Bulbs.....	W. E. Endicott.....
Work of the Season.....	H. 177
Indian Azaleas.....	T. D. Hatfield.....
Notes on Carnations.....	W. N. Craig.....
Early Flowers.....	F. N. Gerow.....
Greenhouse Plants in Bloom.....	G. H. Oliver.....
Adonis vernalis.....	R. M. W. 171
CORRESPONDENCE:—The Hardiness of the Cherokee Rose.....	G. L. C. 179
Notes from the South-west.....	Lora S. La Mance. 179
RECENT PUBLICATIONS	179
NOTES.....	179
ILLUSTRATION:—Rose, Belle Siebrecht, Fig. 27.....	175

The Metropolitan Parks of Boston.

LIKE the memorable preliminary report of 1893, the second annual report of the Metropolitan Park Commission of Boston forms a contribution to the literature of public open spaces of great general interest, as well as of more immediate local concern. The first regular report was issued so soon after the creation of the commission that it formed a document of but slight scope, although the remarks of the landscape architects, Messrs. Olmsted, Olmsted & Eliot, concerning some of the conditions governing the establishment of public reservations, and particularly the definition of their boundaries, were of universal application. The present report is a work which may well make the people of Boston realize what invaluable treasures they possess in the magnificent public reservations that have already been established, as well as quicken their appreciation of the possibilities for enlightened municipal development that are contained within their metropolitan territory.

The wealth of illustrative material enhances greatly the value of this report. Besides a panoramic view of the vast reach of landscape, looking easterly from the highest eminence in the Blue Hills reservation—still called by its commonplace modern designation of Great Blue Hill, instead of its ancient historic name, Massachusetts Mount, which by all means should be restored—there are a number of beautiful photogravure plates, representing various notable scenes in the various reservations, such as the falls, the brook and the noble Oaks in the Beaver Brook reservation; a pleasant woodland interior showing how some of the old “wood-roads” in the Middlesex Fells have been improved for temporary use; and scenes from the borders of various pieces of water in the reservations, including an exceptionally lovely prospect over the Stony Brook Woods, across to the Blue Hills range, with Turtle Pond nestling in the middle distance, amid a sylvan setting. Then there are excellent maps of the several reservations, a diagram showing the relations of the Blue Hills and the Fells Parkways to the metropolitan district, and a careful enumeration in an outline sketch of all the

landmarks visible in the panorama on every side from the Great Blue Hill.

The commissioners report takings to a total extent of 6,070 acres in the four reservations, which they have thus far laid out, while previous takings, amounting to about 1,600 acres, increase the total area in charge of the commission to nearly 7,700 acres. Altogether the total open space for recreative and water-supply uses in the Boston metropolitan district now amounts to almost 14,000 acres. The commissioners discuss their important trust in a conservative spirit that inspires confidence in their capacity for its proper administration. Great activities, yet scarcely entered upon, await them. These include the complicated problem of Charles River, the contemplated taking of the grand stretch of ocean shore at Revere Beach, and the providing of suitable facilities for access to the various reservations by means of parkways and boulevards.

The discussion by the landscape architects of various questions connected with the acquisition and development of public reservations, is of such general application and importance that it should be brought to the attention of park commissions, city authorities and students of municipal economy everywhere. Resuming the consideration of the boundary question, it is pointed out how it has not been the habit of park commissions, speaking generally, to give much attention to the boundaries of public reservations.

It is generally easier to acquire the whole of a given parcel of real estate, though half of it is not really wanted, and then to omit the purchase of any of the next parcel, though half of that is sadly needed, than it is to acquire a part from this and a part from that for the sake of obtaining what is essential and omitting what is of less importance to the landscape of the domain to be preserved. There are few public grounds which are not grossly deformed by the imperfections of their boundaries. Almost everywhere the immediate saving of time and trouble for the surveyor, the conveyancer and the commission concerned has worked permanent injury to public interests in public scenery.

It is pointed out that these large reservations have been taken not for the sake of making an exhibition of fine trees, economic forestry, model roads or any other special thing or things, however desirable, but simply in order to provide the metropolitan community with fine scenery; and consequently that all work done within the reservations ought to be directed solely to preserving, enhancing or making available the charm, the beauty, or the impressiveness of that scenery.

The scenery of all the reservations thus far acquired is essentially sylvan. Sylvan scenery is compounded of the shape of the ground and vegetation. The variously sculptured or modeled forms of the earth's surface furnish the solid body of landscape which man seldom finds time or strength to mar. Vegetation, on the other hand, supplies the dress of living green which man often changes, strips away or spoils, but which he can generally restore if he so chooses.

Emphasis is laid on the necessity of regarding the ancient wood-roads that have been opened up in the reservations to serve pressing administrative needs as merely temporary affairs. They do not and cannot be made to exhibit the scenery as it ought to be and may be exhibited. The report states that one may easily drive through the whole length of the Blue Hills range by the present service road and come away disappointed, and that, contrariwise, it is easily possible to imagine a road along the range which, presenting one quiet or surprising picture after another, could not fail to awaken admiration of scenery in every observer. The reservations will not return to the community that dividend of refreshment which is rightly expected of them until roads and paths shall have been built with special reference to the exhibition of the scenery. Prolonged study, not only of the ground, but of complete topographical maps, is shown to be essential to the devising of such roads.

The opening or closing of vistas, and the modification

of vegetation for the sake of scenery, is work that is greatly needed in the woodlands.

Excepting work directed to ponding or turning water, the selection of high or low, evergreen or deciduous, crowded or separated types of vegetation is practically the only work which can be done for the enhancement of the beauty of the landscape, and work of this kind, well handled, will be productive of remarkable and important results. In general, this work ought to be directed to the selection and encouragement of those forms of vegetation which are characteristic of each type of topography. Sameness of treatment, regardless of site and exposure, is to be scrupulously avoided. On the windy summits of the Blue Hills the dwarf growths native to such hill-tops ought to be preserved or induced to take possession. On sunny crags and ledges, Pitch Pine, Cedar and Juniper should be led to find place, while the Hemlock should appear among shady rocks. At the bases of bold ledges now concealed by dull curtains of stump-growth, large areas may profitably be cleared and even pastured for the sake of exhibiting the forms of the rocks and the grand distant prospects discernible between them. In other places, where only short-lived sprout-growth now exists, seedlings of long-lived trees should be encouraged to start. On slopes of poor soil permanent thickets may be advisable, while some rich glade or valley may be devoted to the development of soft turf and broad-spreading trees. There is thus no limit to the variety of sylvan types of scenery which may gradually be developed within these broad reservations.

It is stated that the more delicate and difficult operations of this art of enhancing the beauty of the vegetal element in landscape must wait upon the building, or at least the planning, of the permanent roads and paths. These roads, it is stated, must be made to exhibit the scenery, and the vegetal scenery must be improved with reference to the roads.

Careful studies of the present conditions of the reservations have been wisely determined upon. For example, groups of competent naturalists have volunteered their services in the study of the flora and the fauna of the several localities. Their notes and their collections will be carefully preserved for reference, and will present invaluable means for comparison as time goes on and changes gradually occur.

Notes upon Poisonous Plants.

FATAL cases of poisoning by eating roots of wild plants, brought to our notice in the pages of the daily prints, again remind us that much remains to be learned by grown people, as well as children, concerning the very active properties of many of our common plants.

It was probably not in the mind of Senator Hatch and others in establishing departments of research in each state that such should be in any direct sense life-saving stations. If these experiment stations are to make life richer in a fuller knowledge of methods of crop-growing they may well find it a part of their work to make human life safer by diffusing information concerning, for example, the poisonous plants that surround us on every hand.

On account of appeals that have been made to the New Jersey Station for facts concerning poisonous plants, and in the face of the many fatal cases of poisoning that have occurred about us, I have been led to look somewhat systematically into the subject, and as a result no less than sixty-five species of plants have been listed and placed upon the roll of suspects. Of these many are injurious only to a slight degree, and that effect is not constant. Some persons can work daily among the roots and fresh leafy shoots of the Poison Ivy, *Rhus Toxicodendron*, without injury, while on the other hand other persons cannot pass near the plants without experiencing physical discomfort. I shall not soon forget the time when both my eyes were swollen to blindness by handling this plant. Many of the plants upon the list are poisonous only when taken into the system. In other words, the poisonous plants may, for convenience, be divided into those poisonous to touch (by contact) and those which are poisonous when eaten (by assimilation). It is to the latter class that attention

should be most emphatically drawn, for these do the most injury.

Twice in the year there are outbreaks of poisoning. One of these occurs in spring, when every one is longing for some green thing, and most frequently the poison is taken into the system in the form of roots. Boys and others "go aforaging," and by accident or otherwise unearth some large fleshy roots; upon tasting them they are found to be sweet, or, at least, not disagreeable, and the mischief is begun, which ends in sickness, and sometimes death. The chances are that the fleshy roots belong to some species of plants of the Parsley family, some of the more common members of which are the Carrot, Parsnip and Celery, all three grown largely for food in the gardens. Even these well-bred plants are still somewhat poisonous to some persons. Thus there are cases of skin afflictions due to the handling of Celery-foliage, and some gardeners need to be protected against it if they work with these plants continuously. In like manner the Carrot is unsuited to some individuals as an article of diet, and when Parsnips are left to run wild in waste places for a few generations, a generation being two years in this plant, the root will become somewhat reduced in size and elaborate a poisonous principle that to many is positively harmless, and with others has caused death. This is by no means the only instance of culture holding the evil qualities in check. When cases of fatal root-poisoning occur it is not unlikely that they are due to the wild Parsnip, *Pastinaca sativa*. A more poisonous species of this Parsley family is the Poison Hemlock, *Conium maculatum*, which has come to us from Europe, and grows in waste places. This is a smooth, much-branched herb, three feet high, the stems of which are marked with purple specks, so that the name of Spotted Parsley is sometimes given to this species. The leaves consist of many leaflets and are ill-scented. A virulent poison, conicine, abounds in all parts, and should not be taken into the system.

A close relative of the *Conium* is the False Parsley, *Cicuta maculata*, also called Spotted Cowbane, Water Hemlock and Beaver Poison. This common species is a tall plant with the stems streaked with purple, but not spotted as in the *Conium*. The root is a deadly poison, and of all our poisonous plants is the part that causes the greatest number of deaths. Other species of the same family that are poisonous and have fleshy roots are the Water Parsnip, *Sium cicutaeifolium*, growing in wet places, and the Cow Parsnip, *Heracleum lanatum*, which is also a coarse plant fond of the low ground.

It is difficult to lay down any rule, hard and fast, to serve as an invariable guide and protection against these venomous plants. The danger of persons eating the herbage to excess is not great, but, as before stated, the injury usually comes from the fleshy roots, which are attractive to the eye and not disagreeable to the taste. These, if eaten in early spring, when they are gorged with the poisonous qualities, are quite sure to lead to unpleasant, if not fatal, results. Every one should be impressed with the fact that some of these poisonous plants pass the winter chiefly as large fleshy roots and are to be shunned. Nothing in the form of wild plants should be eaten unless well known to be harmless, and fleshy roots particularly should be avoided. Most particularly of all let parents and school teachers admonish children of the great danger of promiscuous foraging in fields and woodlands, especially in early spring.

The second outbreak of poisonous cases comes with the ingathering of toadstools during the summer. This subject was fully treated in GARDEN AND FOREST by Dr. Farlow, under "Notes for Mushroom Eaters," about a year ago.

There are a number of plants, particularly in the Heath family, Ericaceæ, that injure live stock, as, for example, the Calf-kill, *Leucothoë racemosa*, and Lamb-kill, *Kalmia angustifolia*, as the common names strongly indicate.

Rutgers College.

Byron D. Halsted.

Four Native Trees in the North-west.

THE importance of proper selection of species for forest-planting was not realized by the early planters on the north-western plains, and to-day the picture of the decaying trees in these early groves is one of the greatest discouragements to forest-planting. The Cottonwood is pre-eminently a tree of bottom lands, and even here it is never crowded into compact groves, but rather spread out into an open belt of varying width, according to the character of the soil and water-supply. Since it is rarely found on the high prairies, one would hardly expect to make lasting groves in such situations, and yet this was the tree most extensively planted at first, and it has proved a failure everywhere except on the low plains. Its almost universal use may be attributed to the facts that it was considered a rapid-growing tree; that it was comparatively abundant and was easily propagated. But when we compare the growth of this species with that of some better native trees one is inclined to dispute the general belief that it grows much more rapidly than other trees.

In the college tree plats here on the high prairie, taking the growth for every year since 1889, the average annual growth of the Cottonwood has been 27.1 inches; that of the Box Elder has been 24.2; of the White Elm, 24.1, and of the Green Ash, 16 inches. It will be seen that the annual growth of the Cottonwood has been only three inches greater than that of the Box Elder and the White Elm, which last tree is counted among those of comparatively slow growth. Of the trees planted in the spring of 1889 the tallest Cottonwood is eighteen feet eight inches high and seventeen inches in circumference at the crown, while the largest White Elm planted in the same year was sixteen feet high and ten and a quarter inches in circumference. A Box Elder of the same age was fifteen feet high, and the best Green Ash was only ten feet and a half high.

This shows some superiority in the Cottonwood in regard to size, but when we examine the trees for hardiness or vigor one of the plats shows that of 330 Cottonwood-trees planted, only fifty-eight per cent. are living, while of 243 Box Elders, ninety-seven per cent. are living; of 111 White Elms, eighty-four per cent. are living, and of 121 Green Ash-trees, eighty-five per cent. are living. Forty-two per cent. loss in the case of the Cottonwood as compared with fifteen per cent. loss in the case of the White Elm is significant.

In addition, then, to the extensive failures of early plantings of Cottonwood, this comparison shows the fruitlessness of using this tree on high prairies. It shows also that although the Box Elder leads the White Elm in average annual growth and in hardiness of constitution—that is, in the percentage of trees that have survived the first six years after planting—it must be remembered that when full-grown the Box Elder is neither a shade-tree nor a timber-tree, while the Elm is both. The Elm grows more rapidly than the Ash, and, so far, it is less subject to insect pests, and, therefore, deserves a higher rank, especially where shade and protection is the object of the planter rather than valuable timber.

State Agricultural College, Brookings, S. D.

L. C. Corbett.

Foreign Correspondence.

Hippeastrums in England.

AT the present time the Hippeastrums are among the most showy and valuable of greenhouse decorative plants. Yesterday I had the pleasure of going through the houses devoted to the cultivation of these plants at the Chelsea establishment of Messrs. James Veitch & Sons, and was much struck with their wonderful variety and beauty. I gather from Bulletin No. 107 of the North Carolina Agricultural Experiment Station that Hippeastrums, or, as they are generally called in gardens, Amaryllis, are not grown to any great extent in the United States. This seems to me

a fact to be regretted, and I hope that some enterprising grower will take up the subject seriously. I have little doubt that success would follow a genuine effort to popularize so gorgeous a flower, and one, moreover, which can be well grown without too much trouble.

THE PARENTAGE OF GARDEN HIPPEASTRUMS.—The race of Hippeastrums, as it now exists in England, is a creation of quite modern date. Some of the wild species or forms which have contributed to make the Hippeastrums what they now are—I am speaking, of course, of the purely artificial products of the gardener's art—have been in cultivation in this country for upwards of a century. *H. equestre*, from tropical America, and *H. Reginæ*, from Mexico, West Indies, etc. (introduced in 1728), have been the principal factors in furnishing the rich, deep red and crimson tints of the earlier hybrids; their influence can even now be discerned in some of the latest seedlings. *H. aulicum*, from central Brazil—introduced in 1819—and *H. vittatum*, an Andean species introduced in 1769, have also played an important part. *H. Leopoldi*, collected in the Peruvian Andes by Pearce and sent by him to Messrs. Veitch in 1869, and *H. pardinum*, also first discovered in the same regions as the last named by Pearce and sent by him to the Chelsea nursery in 1867, have been largely used by Messrs. Veitch in the production of their later seedlings, *H. Leopoldi* much the more extensively of the two. *H. reticulatum*, introduced from south Brazil in 1877, a rather small-flowered species well marked by the crimson veinings and reticulations of the segments, has given rise to a set of beautiful autumn-flowering hybrids, to which sufficient attention has not yet been paid. *H. solandriiflorum*, a species introduced from Brazil in 1820, is remarkable for its long-tubed greenish-white flowers, closely resembling those of some of the Lilies of Japan, the Philippine Islands, etc.; this has given rise to some interesting hybrids, but it has played no part in the production of the regularly formed almost tubeless flowers, which at present so attract the attention of the horticultural public at the spring meetings of the Royal Horticultural Society in London. In fact, the Hippeastrum has become a florist's flower. The green bar in the centre of each segment, perhaps derived from *H. psittacinum*, has been eliminated, and even the base of the segments of many of the dark-colored seedlings is altogether clear of any trace of green. In the light-colored seedlings the green is evident enough. What in England would be regarded as a very great acquisition would be a race with white or blush flowers of as good form and substance as the beautiful rich red ones without the green eye which at present is so conspicuous. Five years ago Mr. Harry Veitch read a paper on the Hippeastrum at one of the meetings of the Royal Horticultural Society, and any one wishing to take up the cultivation of this beautiful genus should not fail to consult this paper, published in full in the society's journal. An extract of a few lines will show what has been done from a gardening standpoint: "Comparing the latest acquisitions with the original species in respect of size, we find that the flowers of the latter range from two and a half to five inches diameter, with segments from three-quarters to one and one-fourth inches broad, and with tubes three to four inches long; that of *H. solandriiflorum* seven to eight inches long. Our best recent types have a diameter of nine to eleven inches, with segments three and a half to four inches broad, and the tube almost obsolete. As regards color, scarlet and red prevail in some of the natural species, crimson-scarlet veins, streaks and reticulations in others, and all with a larger or smaller green centre. . . . We have now an uninterrupted range of colors, from deep maroon-crimson through crimson, crimson-scarlet, pure scarlet, orange-scarlet, carmine, rose and rose-pink, to almost pure white, with striped and reticulated forms of all these shades of color." The dimensions above given, I may say, are now understated.

CULTIVATION.—The plan adopted by Messrs. Veitch & Sons is as follows: Two-thirds good fibrous loam and one-third cow-manure are brought together about the end of

July, and turned over and well mixed about three months later, taking care at all times to prevent the heap from getting too wet. Just before potting, nearly a third in bulk of sharp sand is added. Potting begins in mid-January, and the bulbs flower eight or ten weeks later. After potting, the pots are plunged; spent tan (stored for a year) from the tan-yards is the material used both at Chelsea and at Kew. No bottom-heat is applied at first, and if the soil is damp when used no water is given. For three or four weeks the temperature of the house is kept at fifty-five degrees, Fahrenheit; then a little bottom-heat is given, and the temperature is raised to sixty degrees. When in flower the plants may be moved into a cool house, but very little water will be needed unless the leaves are well developed. More failures result from overwatering than from all other causes combined. After flowering, the pot and half the upper exposed part of the bulb should be plunged again in tan and kept shaded during bright sunshine. A good syringing daily is advisable during bright weather. Bottom-heat, too, is beneficial. Growth is rapid, and the roots run through and over the pots for some feet into the plunging material. As soon as the foliage has attained full size the bottom-heat can be done away with; no shading is necessary, and gradually all light and air possible is allowed, and finally the pots are lifted out of the tan and allowed to stand without water on the beds until the potting season again arrives, when the old soil is shaken away and the dead roots removed. In good strong bulbs there will always be a number of thick, fleshy, healthy, living roots at potting-time, even after a drying of some months.

SEEDLINGS.—At Kew we flower numbers of these in less than two years from sowing the seed. As soon as ripe, say, in May, we sow the seeds in pans in a warm house. When large enough to handle, the young plants are pricked off into beds not too far from the glass, and are kept growing continuously until October of the following year. They are then ripened off and potted in January or February. We sow seeds every year, only allowing those plants to seed which possess the color, form or some other quality desired. By starting with a few good parents a fine series of beautiful seedlings is soon procured. Messrs. Veitch never use manure-water at all, and repot every year. Others are equally successful by treatment widely different—that is, by never shaking out the bulbs at all, but repotting in slightly larger pots until the limit is reached, and using manure-water carefully during season of growth. A little crushed bone mixed with the soil is beneficial. The way we manage the bottom-heat at Kew is to have hot-water pipes—provided with valves, so as to regulate heat or stop it altogether—underneath the plunging-beds. The side walls which support the slabs on which the plunging material is placed prevent the heat from escaping laterally to any extent. By following such a course of treatment failure is practically impossible, but I am sure that in many parts of the United States really good results could be obtained by growing in cold frames. It is distinctly desirable to keep up a succession of seedlings, as plants propagated only from offsets have not the vigor of seedlings. Given good varieties to begin with, and cross-fertilization practiced only with vigorous bright colored or well-formed flowers, and all the resulting seedlings are well worth growing.

Kew.

New or Little-known Plants.

Rose, Belle Siebrecht.

AN illustration of this Rose, which is being distributed this year for the first time by Messrs. Siebrecht & Wadley, of this city, will be found on page 175 of this issue. The plant has already proved valuable when grown under glass. Its habit of constant bloom and the color of its flowers, which is a solid deep shade of pink, quite novel in Roses of this class, make it very useful for commercial florists. It is

a vigorous grower and an abundant producer of good-sized flowers; the buds tapering and borne on long stout stems well furnished with vigorous leaves. Another strong point in its favor is the singular purity and richness of its color as seen under artificial light, and it really shows up more brilliantly under these conditions than any of the Roses now grown for commercial purposes. We are assured that the plants have proved perfectly hardy in the latitude of New York for several years, and if it has a constitution to endure our winters it will be a most welcome addition to our hardy garden Roses, since we have so few which flower the season through.

The plant is said to have originated with Messrs. Dickson & Sons, of Newtownards, Ireland, and, under the name of Mrs. W. J. Grant, it received the gold medal of the National Rose Society at the Chester show in 1892. It is said to be a cross between La France, which came from the seed of a Tea Rose, and Lady Mary Fitzwilliam, which is also a Hybrid Tea. This parentage will account for its ever-blooming qualities and its delightful fragrance.

Plant Notes.

LINDERA BENZOIN.—This hardy native Benzoin, Spice-wood or Spice-bush, sometimes called Fever-bush or Benjamin-bush, may be considered as familiar to comparatively few people, either as a garden-plant or in its native habitat in our woods, where it delights in moist rich soils or along the courses of streams and rivulets. Under good conditions it becomes a tall shrub six or eight to twelve or fifteen feet high, and it is among the earliest, although it is not the very earliest, of our indigenous species to blossom. In flower it always attracts attention by its short axillary, umbel-like clusters of small honey-yellow colored blossoms, which appear thickly along the naked branches long before there are any leaves visible. The Spice-bush is dioecious, bearing its staminate or pollen flowers and its pistillate or fruit-producing flowers on separate plants, and the usually more numerous blossoms and the yellow anthers of the male or staminate plants give them a generally brighter aspect. The oval, smooth, shining bright red fruit, which matures in the autumn, is more conspicuous than the flowers, and remains on the plant until after the leaves fall, if it is not previously eaten by birds, some kinds of which seem very fond of it. In planting the Spice-bush for the autumnal fruitage a majority of the plants selected should be pistillate, but a few staminate plants should be placed among them, so as to insure fertilization. If, on the other hand, it is desired to get the best effect from the not very conspicuous early spring flowers the staminate plants would prove somewhat the most attractive. In a natural condition in shady places the plants commonly have a thin and straggling appearance, but growing in good garden-soil or by judicious pruning they form neat compact bushes. Although in nature the Spice-bush is generally found in moist situations, its free growth in ordinary shrubbery plantations or in garden cultivation shows that unusual moisture is not essential to its vigorous development. The leaves change to a pretty soft yellow color before they fall. All parts of the Spice-bush are richly spicy, aromatic, but this quality is strongest in the bark and fruit. In some parts of the country the people use an infusion or decoction of the twigs or bark as a drink in fevers or as a vermifuge, and the dried and powdered fruits were sometimes used as a substitute for allspice during the Revolutionary War. The benzoin of commerce is derived from an entirely different East Indian plant, or plants, belonging to another family. The drug was early known as "Incense of Java," or by the Arab name, "Luban Jawi." By leaving off the two first letters of the first word it is said the name gradually became corrupted and changed until it got to Benjamin, the product being sometimes known as Gum Benjamin, and our Lindera getting its occasional name of Benjamin-bush from some similarity in odor to the product from the oriental tree.

PRUNUS DAVIDIANA.—This fine, early-flowering Peach, or Plum, is now in full bloom in the Arnold Arboretum. It is almost wonderful to see this handsome tree, twelve to fifteen feet high, with its large white flowers, borne in the great-

Plum, is a mass of white—not absolutely snow-white, however, for a slight tinge of color heightens the effect. This plant appears to be perfectly hardy, but early frosts sometimes destroy or diminish the bloom in this vicinity, which

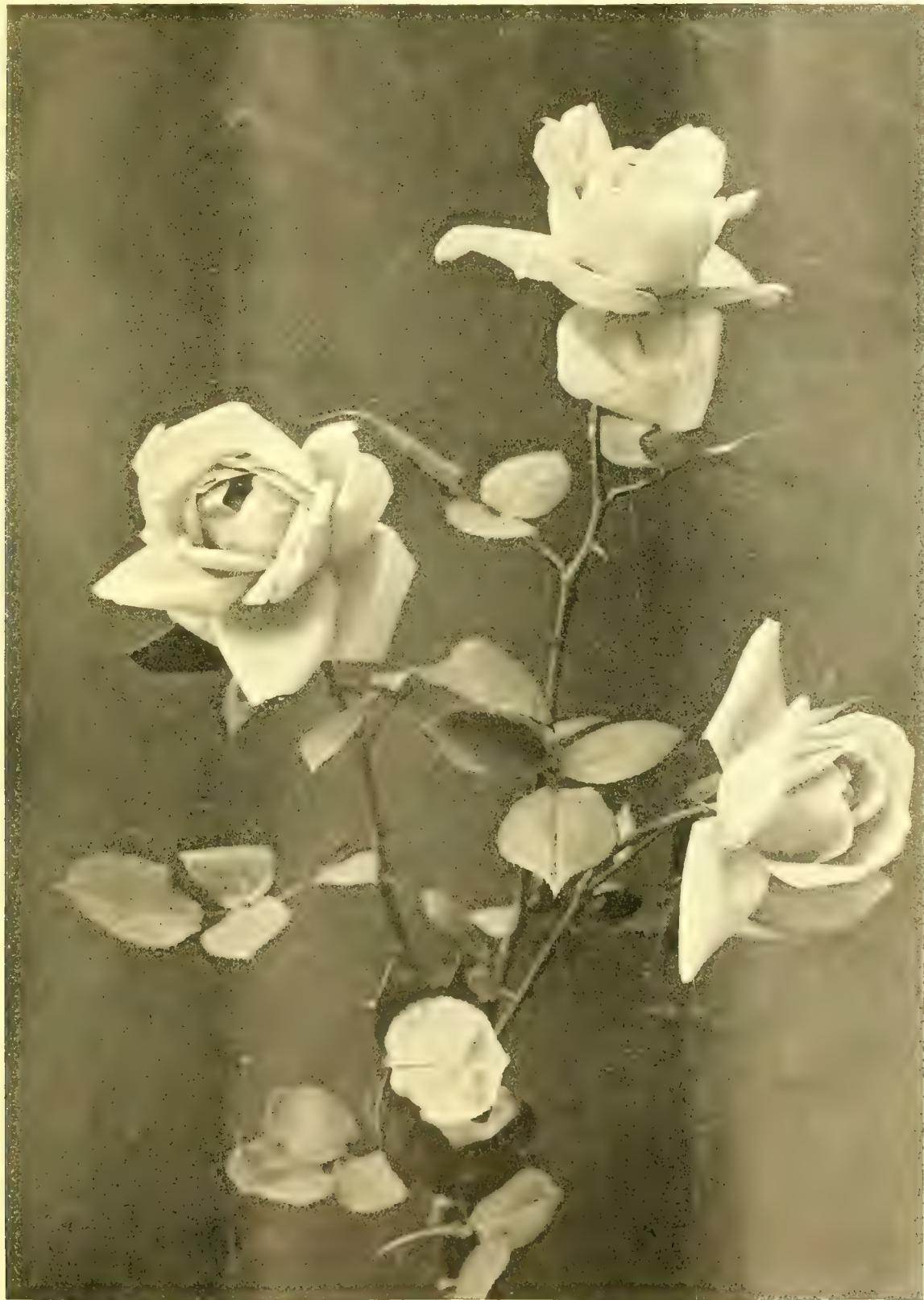


Fig. 27.—Rose, Belle Siebrecht.—See page 174.

est abundance, at this season before Forsythia or *Spiraea Thunbergii* even begins to show color. The flowers literally cover the tree; just as a little later, the familiar Peach, its close relation, is clothed with pink, so now, this Peach, or

is quite natural under the circumstances and not a sufficient reason for discarding it from our collections; one favorable season out of three would justify its cultivation. It demands the same sort of treatment given to the

Japanese Plums—that is, a well-drained soil, a sheltered position and plenty of food. The propagation is by grafting.

ERYTHRONIUMS.—Dog-tooth Violets are familiar wild flowers in the states east of the Mississippi, where carpets of their beautiful leaves are often seen in slightly shaded places. While the flowers are abundant in some cases, whole colonies of the plants will be found with few, if any, flowers during their season. This is owing to lack of maturity of the bulbs, and sometimes to their increase in numbers. The root-action and habit of increase of Erythroniums are curious and interesting and have given rise to much discussion. It occurred lately to one inquirer to investigate the real facts, which he discovered by cultivation in glass-sided boxes, and Mr. Blodgett, in the *Botanical Gazette*, vol. xix., page 61, has given a very lucid account of the reproduction of the species. The California Erythroniums are probably not much grown in eastern gardens, though they are perfectly hardy in this latitude and of the easiest culture. All the species are charming little plants. Their leaves are usually richly spotted and marked with colorations quite distinct from our eastern Adder's Tongue. *E. Howelli* has pretty flowers, salmon-pink in color. The leaves of this species are handsomely figured. *E. purpurascens* is deeper in its shadings, and is a combination of yellow and reddish purple. *E. citrina* has large flowers of citron-yellow, with a lighter centre. *E. grandiflora* and *E. Hendersonii* have respectively yellow and dark purple flowers. On strong bulbs the scapes will often bear two flowers. The effect of all these species is very pleasing and quite distinct from *E. Americanum*. They flower here in April.

TULIPA KAUFMANNIANA.—This beautiful Tulip is now in full flower, while the Duc von Thol Tulips, in the same border, are hardly showing buds, much less color; it is certainly the best early Tulip we have. It is a native of central Asia and has been in cultivation since 1877; it is apparently slow in propagation, or its merits are not widely known, for the bulbs are still difficult to obtain and are high-priced. The perianth is a bright sulphur-yellow, tinted with red, and as large as *Tulipa Gesneriana*; the peduncle is eight inches or more high, but varies somewhat, according to bad or favorable seasons; the leaves are large and glaucous. Taken altogether, it is a plant deserving high commendation.

IRIS ORCHIOIDES.—This Turkestan species is the second yellow Iris of the season, being preceded by the little *I. Danfordiae* by a month or more usually. *I. orchoides* is one of the Juno section, and Mr. Gerard, after testing it for three years, pronounces it reliably hardy here, and rather more robust than *I. Caucasicus*, *I. persica* and others of the same section. Heavy soil and a sunny location seem to suit it perfectly. It resembles *I. Caucasicus* in habit, though a taller plant, in having two rows of long tapering lax leaves clasping the stem in opposite rows. The stems are one and a half to two feet high. The flowers are small, but, as there are three or four opened at once usually on the same stem, a colony of this Iris is very attractive. Its leaves commence to appear very early in the season, and are sometimes touched by hard frosts. Curiously enough they were not injured at all this year, though the plants caught the early morning sun during the extremely cold early year, a most severe test for any plant. There is also a variety of this plant with lavender-colored flowers. *I. Caucasicus*, which flowers slightly earlier, might dispute the place of the second early yellow Iris, but its color is at best a greenish yellow, and the type is scarcely worth garden room.

IRIS SINDJARENSE.—from Mount Sindjar, Mesopotamia, has already been noted in GARDEN AND FOREST as a very handsome Juno Iris, with charming flowers of a light lavender hue and pleasantly fragrant. This has a habit similar to that of *I. orchoides*, though the stems are shorter, the flowers less frequent, and the leaves a darker green. The

flowers are also borne on shorter stems and are larger and more effective from their broader falls. This has survived two winters with Mr. Gerard, but does not seem as vigorous as *I. orchoides*. It commences to grow just before the end of November. *I. Sindjarense*, *I. orchoides* and *I. Rosenbachiana* are a trio of Irises of the same section which should please any grower of hardy plants.

NYMPHÆA FLAMMEA.—Flowers of this Water-lily have been sent us by Mr. J. Brydon, Yarmouthport, Massachusetts. This is one of a valuable series of hybrids produced by Monsieur Marliac, of which he gave an interesting account last year. It seems that he succeeded in securing a hybrid between a tropical *Nymphaea* and one of the hardy species of the north, and this hybrid produces seeds abundantly. Monsieur Marliac has in this way produced a series of hybrids, ranging in color from white to intense red. They generally bear medium or small-sized flowers; they are perfectly hardy and very free and continuous bloomers. *N. Laydekeri* of this series is now well known to growers of aquatics and is very satisfactory in cultivation. The flowers on first opening are a delicate pink, changing later to cherry-red. *N. flammea* appears to be of similar habit, size and character, but is much more intense in color. In the old flower sent us the color approaches that of *N. rubra*, but is not quite a self-color. Another variety, *N. ignea*, is said to be more intense in color. The new varieties, unlike *N. Laydekeri*, it is said, can be propagated by division.

OCHNA MULTIFLORA.—A London nurseryman recently reintroduced this stove evergreen, which was first brought to England in 1820, but somehow became lost for a long time. It is most attractive when in fruit. The flowers are somewhat like those of a yellow *Potentilla*. After the petals fade the calyx and receptacle gradually change from a greenish yellow to a rich vermillion; the receptacle enlarges considerably, and on it are the carpels, about six in number, containing the seed. The carpels, which are at first a pea green color, change when ripe to a deep purple, and give the plant a very odd appearance. It does well in a temperate house. The seeds germinate freely in a few weeks after being sown.

OXALIS BOWIEI.—To be in flower at this season these bulbs should be potted up and started in three-inch pots about the beginning of January. Afterward three or four of the plants may be massed in a wire basket and hung up in a warm greenhouse near the roof. Perhaps no other plant makes so pleasing a display of flowers and foliage for such a small sum of money. *Oxalis Bowiei* can be brought into flower at any time of the year by putting in the bulbs, in winter-time, about two months ahead of the time they are wanted in bloom, and in summer three or four weeks ahead of the time will suffice. It is unsatisfactory to buy mixed collections of *Oxalis*, since there are so many species of little or no value, and scarcely any two of them have the same habits. The flowers of *O. Bowiei* are a light rose color, and when well developed they are nearly two inches in diameter. *O. cuprea* and *O. versicolor* are two very good kinds; they have yellow and white flowers respectively.

Cultural Department.

Spring-flowering Bulbs.

MY custom is to uncover my bulb-beds during the first week of April. This is early enough for this latitude; indeed, some would consider it too early, but I do not leave the ground wholly bare. There will still be sharp frosts which will nip the tender shoots which have started beneath the covering, and so a little hay or other material should be left where it can be easily got when a chilly evening threatens. The young sprouts will become hardened in ten days so as to stand any cold which is likely to come. *Ixiolirions* will come up under covering so colorless as to appear almost transparent, and things as hardy as *Alliums*, when first exposed to the air, are unable to endure any frost at all. Then, why not delay two weeks longer? might be asked. For this reason: By the middle of April many of the early-starting things would be

grown so lank and long that they would be unable to recover their proper sturdiness. It is better to uncover too early than too late. Although the winter was severe, I find nearly everything has come through in good condition; indeed, much to my surprise, I find that some tubers of *Bletia hyacinthinæ*, planted four inches deep and entirely unprotected by covering, are alive and sound. Some tubers of *Smilax*, also uncovered, appear sound, but about them I am not sure. Both of these I have grown successfully out-of-doors with a few inches of leaves over them, and it now seems that even that precaution is not always necessary. Until three years ago I did not care much for *Ixias*—not that I did not admire their beauty, but it was too much trouble to grow them under glass; but of late I have grown them out-of-doors with complete success. They should be planted very late, so that they shall not make an autumnal growth (the end of November is a good time), and should then be covered with several inches of some material, the leaves of the Pine in preference. Over these I have heretofore laid shutters to turn off the rain, but I find this not really necessary; the bulbs will do as well without it, but will be a little later in starting. I planted last November a great many *Tritonias* and *Sparaxis* with the *Ixias*; the former are not yet up, but the *Sparaxis* are doing finely. *S. (Dierama) pulcherrima* is dead, I am sorry to say, and somewhat surprised as well, for Mr. Putnam has wintered it in Salem, twenty miles farther north than Canton.

The Snowdrops, of course, are past, but *Erythronium albidum*, which began to blossom before they did, has still a flower or two. The first *Narcissus* this year is *Minimus*, a perfect gem, of the same shape as *Emperor*, and comparing with it as David with Goliath. *Scoticus*, which usually takes precedence, is, as yet, hardly showing bud. The flowers of all varieties of *Narcissi* in my grounds are likely to be very few. No *Tulips* are yet showing color, the most advanced at the present time being *White Pottebakker* and *Tulipa Greigi*, the latter being bulbs kept over winter in the cellar, and planted out April 1st. I tried the same plan last year both with that *Tulip* and *Iris Susiana*, and found it perfectly successful.

Canton, Mass.

W. E. Endicott.

Work of the Season.

SPECIMEN *Gloxinias* are now in eight-inch pots, and the earliest have a good spread of leaves and promise to be in bloom by the middle of May. A second batch, from seeds sown late last summer, will come in July. They will be our earliest next season. We find it better to raise a lot of small bulbs each summer, as these always make much finer plants than seedlings raised the current season, no matter how early the seeds are sown, and, besides, it is easier to raise them during the heat of summer. Of late years we have found it better to keep the bulbs in the pots or boxes in which they have grown, than to shake them out and store them in sand. Whenever the bulbs shrivel, as they must when kept in this way, a loss of vitality results, no matter if they plump up when watered. Our bulbs are kept under the greenhouse benches, protected from the direct influence of hot-water pipes by boards. They will need water two or three times during the dormant season, but we always try them, and if firm they are passed by. Despite the moderate temperature, growth commences early in March, and as fast as a few leaves show we bring them to the light. Our finest plants last season were those which we did not repot. We grew them over, with the aid of a little manure-water, when coming into flower. Success with these does not depend so much on soil, although I used to think it did. Proper location is more important. The best structure to grow *Gloxinias* in is a low, close house, so ventilated that direct air does not strike them near the glass, but yet screened by a light shading. These conditions are essential. For a while our plants are kept on the dry side. In fact, they are never thoroughly watered until considerable growth has been made. *Gloxinias* are to a great extent surface-rooters, and to wet the whole mass of earth means stagnation. Proper aeration of the soil is important. Whenever we find a plant not doing well in a pot we can nearly always trace it to a defect in this particular.

Seed of Chinese *Primulas* should be sown now for autumn and winter blooming. I make no choice of the many strains offered. If obtained from a reputable seedsman they should be good. Free drainage and light soil are essential for these in the earlier stages. When well-rooted and ready to go into the flowering-pots late in August a little heavier soil may be used. Opinions vary on this point, and I have seen first-class *Primulas* grown all through the season in very light soil. The plants will do better during the summer months in cold frames having an easterly exposure, with the sashes slightly shaded

and well tilted to allow of free circulation of air, night and day. As naturally the plants bloom early, only large specimens can be had by taking out the flowering scapes as they appear until within three or four weeks of the time they are required to bloom. At the same time any poor varieties can be weeded out.

It is probable that many of the large specimen plants of *Cyclamen Persicum* exhibited in Horticultural Hall, Boston, at the last spring show, were two-year-old bulbs. It is a common practice to raise seedlings the preceding summer, and keep them growing for fifteen or eighteen months. For ordinary decorative purposes plants in six-inch pots, with about twenty-five flowers, are large enough, and usually can be grown from seeds sown in December. In the early stages light soil should be used. Some growers use dry sphagnum-moss, chopped fine, and broken charcoal mixed with the loam. Charcoal, as an auxiliary in draining and sweetening the soil, is not as generally used as it should be. Heavier soil may be used later. The summer treatment accorded Chinese *Primulas* suits *Cyclamens* exactly. *Cyclamens* have not done well with me of late years. I have been compelled to throw away handsome-looking plants every year, through attacks of the root-gall, presumably, nematodes of some kind. It is difficult to get loam free from them.

Looking months ahead, sometimes a whole season, we divide up our last year's stock of *Astilbe Japonica* for lifting next autumn. Those forced this season need resting; so also with *Deutzia gracilis*. A few cuttings put in every year keeps our stock replenished; soft shoots taken now from plants in bloom answer well. I can bear out Mr. Craig's statement that it is better to grow these plants altogether in pots, as I have grown mine in this way now for three years. It is better to propagate *Marguerite Daisies* and *Stevias* in June and grow them in pots than to plant them out. Thus treated they are more easily handled and kept in better shape than when planted out. The little blue *Paris Daisy*, *Agathæa celestis*, is an excellent winter bloomer. It is equally good in summer. It seems to me it would make a good bedding-plant, although I have never seen it tried. *Cytisus* of all kinds when small should be grown in pots; large specimens, with a good ball of earth, do better turned out. Indian *Azaleas* may safely be planted out, and even *Camellias*, but care must be taken that the surrounding soil is packed firmly to the ball of earth.

Wellesley, Mass.

H.

Indian Azaleas.

MANY people who have bought Indian *Azaleas* for Easter decorations will hardly know what to do with their plants when out of bloom. The majority, no doubt, were imported plants, potted in indifferent soil, as a medium for forcing and convenience in handling, rather than for growing them on continuously in the pot. All dead flowers, with the seed-vessels, should be picked off, and any soft growth, which often comes with the blooms, should be cut away, so as to keep the plant in neat bush shape. Ample time will be left for new and more even growth to develop and properly ripen before the autumn. It is customary in small towns to "board" the plants until the next season with the neighboring florist. This is, no doubt, a good plan for those who have no garden; but those who have—and such people are, as a rule, interested in caring for their plants themselves—will have no difficulty in growing them. They will do well in any good garden-soil. A partly shaded position is best suited for them, such as might be given on the north side of an Apple-tree or Pear-tree. In turning the plants out of the pots it will be found that very few new roots, if any, have been made. The original ball of earth should be pricked, or, rather, scratched, over with a pointed stick, so that the new soil will better adhere to it. The planting ought to be made in a slight depression or basin, with the ball covered not more than an inch, and the soil packed firmly about it, so that when water is given it should run through it rather than between the sides and the new earth. This is important. The planting out may be done any time after danger of frost is past, and from then until the first of September abundance of water should be given—twice a day during dry weather, and even a day or two after rain, although the soil may appear moist enough, it would be safer to give water. After the first of September less water will be needed, but it should never be withheld long enough for the ball to get dry. Some time in October the plants will need repotting, and as only a few fine roots will be found on the outside of the original ball a pot but little larger than the one in which it was flowered will be large enough. Some fine sandy loam should be carefully sifted in, so as to make sure there are no air-spaces left, and the whole made still further firm with a lath jammed in along the sides of the pot. The flower-buds will be already set, and

may be felt in the leafy tips of the shoots. The object now should be to keep the plants as dormant as possible. Very little light will suffice, providing that the temperature of the storage-place is low enough, say, forty degrees, Fahrenheit, not to excite them into growth. They may be kept in first-rate condition in an ordinary barn-cellars; even a house-cellars would do if shut off from furnace-heat. Water might be needed once a week or once a month; it depends on whether the place they are kept in is dry or moist. A month before Easter is early enough to bring them out into warmth and light, and they will bloom well in an ordinary house-window.

T. D. Hatfield.

Wellesley, Mass.

Notes on Carnations.

THE time for planting young stock out-of-doors is now close at hand and the plants should be gradually hardened off. Ours are now in cold frames, where they are freely ventilated, and some air is left on overnight, except when frost is threatened. In this latitude we usually commence to plant out from the 15th to the 20th of May. In some years there is a light frost after these dates, and Coleus or other tender bedding-plants are killed, but Carnations have not been damaged. We allow our plants eighteen inches between the rows and place them a foot apart in the rows. Between every fourth row we leave a path two feet wide. The plants can be topped and hoed from these paths and all weeds raked into them.

The soil best suited to most varieties of Carnations appears to be a rather light, sandy loam well enriched with manure. Certain varieties prefer a heavier soil, and the finest Grace Wilders I have seen were grown in a heavy clayey loam. As a general rule, however, we find that Carnations do best in a sandy compost. They also lift with much better roots at planting time.

Summer-blooming Carnation plants should now be nicely rooted in three-inch pots. These should not be stopped after this time if good flowers are desired by the middle of July. Mrs. Fisher is still the best all-around variety in this class. It is as satisfactory for summer flowers as it is unsatisfactory for winter blooms. Nobscot is unexcelled as a scarlet. William Scott and Daybreak are good bloomers of their respective shades of pink, and F. Mangold does fairly well as a crimson. We usually test a few plants of the newer varieties each season to try their capabilities as outdoor bloomers; it is possible some kinds, while not successes indoors, may prove useful outside. Young stock to be grown along for next winter's crop should be gone over at least once a week and stopped before running up too much. As a rule these are grown in boxes; if in pots they will need very careful attention in watering, as at this season they dry out rapidly. If they are becoming pot bound they should be transferred to a pot a size larger.

Carnation-houses will now need an abundance of ventilation. In addition to opening the roof-ventilator, some side or bottom air should be admitted daily on bright days unless a cold wind prevails. A good crack of air should be left on all night. Under no circumstances should ventilators be closed tight after this season of the year. On the morning of every clear day we give our plants a thorough good syringing; this is necessary to keep down that insidious foe, red spider, which will quickly ruin a batch of plants if these precautionary measures are not used.

Plants indoors are now giving an abundance of flowers. The individual flowers are diminishing somewhat in size, and as the beds are a mass of roots, abundant watering is needed and slightly stronger stimulants. We have gone over our plants recently, cleaned and tied them up for the last time, and after slightly loosening the surface gave them a mulching of well-rotted cow manure screened through a one-inch sieve. The plants repay this attention. Quite a number of growers do not stake their plants at all, and seldom or never clean them, at this season of the year. Plants so neglected show a marked contrast to those more carefully looked after. Certainly no one who has once staked and cleaned his plants will want to go back to the old careless and slovenly method of growing them. We find that during bright weather such as we are now having, our plants require a good watering every other day, and once a week we use stimulants. Some shade will now be needed on the glass. We use a mixture of naphtha and common whiting to which is added a little hard boiled linseed oil. The shade is applied with a common whitewash brush; it need not be put on thickly as yet.

Some Carnations which have not bloomed very freely during winter are now giving fine crops of flowers. Among pink ones

Ada Byron easily takes the lead with us. It is to be regretted that this variety is not a satisfactory winter bloomer. It has a beautifully fringed flower of good size and color, with a delightful odor, and is borne on a dense stout stem; we have not seen a burst calyx. As a spring and summer bloomer it is unsurpassed. Helen Keller, the best striped variety in commerce, is a grand sort grown as Messrs. Lonsdale and Daille-douze showed it at the Boston Carnation Show. We find, however, that it has a bad habit of "going sleepy" or fading out its blooms instead of opening them properly. Fully half the flowers on the small lot of plants we grew are useless, and other growers near by say theirs are similarly affected. We purpose trying ours in a heavier compost next season. Among pink varieties, William Scott is far the most consistent bloomer, and appears to give general satisfaction. Some growers still cling to the old Grace Wilder, and two thousand of these flowers which I saw recently were excellent, though in some instances the calyx was burst. Fred Creighton, another pink variety, almost discarded, was also noted in splendid condition. This variety gives a great spring crop of bloom, but flowers only moderately in winter.

Some of the new varieties sent out during the present year promise to be of first quality. Alaska, from Mr. Chitty, and Storm King, from Mr. Ward, are very highly spoken of by all who have seen them, and the Canadian variety, Bride of Erlestort, has many admirers. Meteor is bidding for popular favor as a crimson, while Mr. Dorner's Bridesmaid, Mr. Simmons' Rose Queen and Mr. Hunt's Peachblow are all promising pink varieties. It is unfortunate that the new yellow, Dean Hole, has been attacked by rust. There is much need of a good yellow, since none of the kinds at present grown are very satisfactory. A good scarlet which will bloom and grow as well as Portia, with flowers the size of Hector, is much needed. Hector is a fine scarlet, but it has defects in its lack of stem, bursting of calyx and fading out of flower. It is, however, a good Carnation, and the best one of its color now grown.

Taunton, Mass.

W. N. Craig.

Early Flowers.

THERE are few prettier sights in the garden on a bright sunny day of the early year than a bed of the little *Anemone blanda* or *A. Apennina*. I fear that there are few rarer sights than a good colony of the first species unless more care is taken of them than is usual in the average garden, for, like all plants which die down, in the early year they offer special opportunities to the destructive garden-helper. It will probably be found to be the best practice to take up the tubers when ripened and store them in sand in the early autumn, when they may be replanted. The small pieces of roots of this species usually received make large strong tubers, even in our heavy soil, and I think it is only the tidying up of the borders which prevents their constant increase, for a lot of tubers planted between Sedums and other plants, which are watered during the summer, hold their own. My impression is that *Anemone blanda* is adapting itself to our climatic conditions in its flowering period. Our winters are so variable that one can only arrive at an accurate conclusion after many years' experience, and this plant has been grown here only five seasons. When first grown it flowered about the first of January, the season being open. Since then the period of flowering has varied greatly, but on the whole with a later tendency. This year they are yet in flower at a time when *A. Apennina* is usually expected.

Up to the present time the garden is dependent almost entirely on bulbous plants for flowers, the few *Saxifrages* and small alpine plants not making much effect, and, in fact, being unreliable and uncertain here. As yet among the non-bulbous plants flowers are only found on Hepaticas, hybrid Primroses, *Dondia epipactis* and *Arabis alpina*, with the alpine Poppies and *Aubrietas* just opening. Hepaticas being abundant in the woods are too much neglected in gardens, where, in a suitable location, they thrive and are a capital illustration of the rare beauty of common things. I wish Primroses were as common as their beauty deserves. They are plants so easily grown and increase so rapidly that there seems no reason why they should not be seen in every garden, and at this season they cover themselves with lovely flowers, ranging in color from white, through the yellows and reds. A well-grown Primrose, with flowers on single stems, poised just over the lusty leaves, is a very pleasing sight. *Arabis* is the best white-flowered plant of the spring, as its prostrate growth is covered with sunny bloom. It has a pleasing way of wandering around the garden and showing at this time its flowers in new places.

Elizabeth, N. J.

J. N. Gerard.

Greenhouse Plants in Bloom.—Among the noteworthy plants in bloom here at the present time are several good old things which are not so well known as they might be. Among the climbers, *Petraea volubilis* is quite a pleasing sight. The flowers are arranged in long racemes opposite each other; they are bright purple, both calyx and corolla being nearly of the same color. There is a white variety not very commonly met with which is a pleasing companion to the purple one. The *Petraea*, from its habit of growth, requires a position where it can be planted out. It is a quick grower, reaching a height of about twelve feet before it makes much of a show.

Adenocalymna comosa, a beautiful yellow-flowered Bignoniaceous vine, is blooming for the second time this season. In the large Palm-house it may be seen twined in festoons from Palm to Palm, and occasionally a long shoot hanging down, beautifully laden with flowers. This is a good vine for a large greenhouse; it seems to do equally well in sun or shade. It is propagated by means of cuttings taken off before the young wood begins to push out. The cuttings will root either with or without a heel.

Botanic Garden, Washington.

G. W. Oliver.

Adonis vernalis.—This thoroughly good plant is now in bloom, the large yellow corolla, with its deeply cut leaf, reminding one of the earlier Winter Aconite, and makes a pleasing successor. It is a native of southern Europe and is one of the oldest garden-plants, although, strangely enough, it is found in comparatively few American gardens. It is perfectly hardy and thrives in almost any soil and situation; it is a good plant for the rock-work on the garden border. One caution should be observed by those who try to cultivate it, and that is to avoid transplanting it too often; it should be planted where it is to stay and left undisturbed for years. With this treatment a single plant soon becomes a clump, bearing numerous flowers and making a bright feature in the early spring garden. The propagation is by division, but plants are so inexpensive that it is much better to increase one's stock by purchase. The best time for planting is October or early November.

Jamaica Plain, Mass.

B. M. W.

Correspondence.

Notes from the South-west.

To the Editor of GARDEN AND FOREST:

Sir,—We have just passed through the most severe winter known here since the war. Gladioli and Montbretias by the hundreds, Cannas and Dahlias by the score, that I have left for fifteen years in the open ground over winter, are this spring but bits of rotted pulp. *Solanum jasminoides*, *Physianthus albens*, *Antigonon Leptopus*, *Ipomoea Mexicana* and *Manettia cordifolia*, all beautiful half-hardy vines that for a half-dozen years have stood the winters unprotected, sheltered only by a lee of the building, are dead as the proverbial nail this spring.

On the other hand, Peach-trees, the blossoms of which were killed both last year and the year before, were remarkably full of bloom this year, and I have never seen my Tea and Hybrid Perpetual Roses with so little dead or unsound wood on them at this season of the year. It is a matter of comment how full of bloom all shrubs and trees are. It is worthy of notice, also, that none of the hardier plants, Hyacinths, Tulips, Crocus, etc., were injured in the least.

The lesson is plain. We people of the south and south-west must protect half-hardy bulbs and tubers over winter by heavy mulching. To be sure, we may cover them ten times, and the ground never freeze below a two-inch crust; but the eleventh time an exceptional winter may come, and the ground freeze to more than twice that depth, when the entire stock gathered together through many a laborious year will be lost. If this mulching is of rotted manure the labor need not be lost in any event, for by spring it is more rotted and friable, and can then be dug in the beds to enrich them. Some of our beds were lightly covered with manure last fall. In these quite a number of half-hardy bulbs survived. A deeper covering would have saved them all.

One of our Pear-trees is showing a singular freak. It is covered with extra-large flowers, each distinctly semi-double. Each blossom has from ten to twelve broad, white petals, and the large clusters are very ornamental.

Pineville, Mo.

Lora S. La Mance.

The Hardiness of the Cherokee Rose.

To the Editor of GARDEN AND FOREST:

Sir,—On page 114 it is said that the Cherokee Rose is tender, and in the north suited only to the greenhouse.

Will you permit me, in the interest of the wider open-air culture of this handsome Rose species, to say that a plant of *Rosa Sinica*, obtained two years ago from Messrs. W. Paul & Son, of Waltham Cross, England, has not only survived the past winter here with absolutely no protection, but has now broken vigorously into leaf almost to the tips of its spray-like growth. Thirty-three degrees of frost were registered by the thermometer in the screen and continued high winds prevailed.

Salem, N.J.

G. L. C.

[The Cherokee Rose, as naturalized in this country, is not hardy as far north as New Jersey. It will survive mild winters in Washington, but is not reliably hardy there. It is a noteworthy fact, therefore, that a plant of this species has survived the late trying winter in Salem, New Jersey, and it would be very interesting to know from what quarter Messrs. Paul & Son received their stock. It is a well-known fact that plants of the same species vary in their ability to resist cold when taken from a more southern or more northern part of their natural habitat. Thus, the so-called Japanese Persimmon, or Kaki, is only known in this country as a semi-tropical tree, while plants of apparently the same species flourish in a climate as rigorous as that of New England, and, no doubt, seedlings from these trees would prove hardy in a much colder climate than the Kaki as it is known in Florida and southern California. It may well be that Messrs. Paul & Son have received some plants or seed of *Rosa Sinica* from a more northern region than that from which the original Cherokee Rose was derived. It is to be hoped that the stock from our correspondent's plant will be tried in still more northern latitudes.—ED.]

Recent Publications.

List of the Pteridophyta and Spermatophyta growing without cultivation in north-eastern North America, prepared by the committee of the Botanical Club of the American Association for the Advancement of Science, from the Memoirs of the Torrey Botanical Club. Volume V.

This book has grown out of the discussions of the principles of plant nomenclature which have been going on for the last ten years in the United States with much activity, and not always in the best taste. The matter was taken up by the botanists of the American Association for the Advancement of Science at their meeting held at Rochester, in 1892, where a committee was appointed which drafted the set of resolutions to govern the naming of plants, which have been adopted in the preparation of this report. It is unnecessary here to discuss the principles of this code, as they are now well known, and are substantially those adopted in this journal, and now by nearly all the working botanists of the United States, and it is enough to say, perhaps, that in most cases the catalogue appears to have been well done, although an examination of some groups will show that the compilers performed their work carelessly, or were not supplied with all the literature on the subject; and in other groups species have been proposed which can hardly be retained when the plants are studied by monographers from the point of view of their characters, and not merely of the names which botanists have applied to them, as must have been the case in the preparation of a catalogue of this kind in the short time that has been devoted to it. The names of plants are important, of course, to all working botanists, and it is well to have those of north-eastern North America arranged here conveniently with their synonyms; but, after all, the name of a plant is one of the least important things about it; certainly less important than its morphological characters, relationship, distribution, properties and uses.

It is now eight years since Professor Asa Gray died, leaving his *Synoptical Flora of North America* half-finished. The task of completing this great work, in which it was proposed to describe briefly all the plants in North America north of Mexico, fell upon Mr. Sereno Watson. He died three years ago, and since Professor Gray's death not a page of the *Synoptical Flora* has appeared. Now, however,

that the question of the names of the plants in one part of the country has been settled, or almost settled, perhaps the long-felt want of a comprehensive Flora of North America in compact form, and suitable for the use of students, may be supplied for them. Such a work can never be final, but it is absolutely needed, even if it is imperfect, to enable students and collectors in all parts of the country to carry on their investigations intelligently.

Notes.

Among the flowers for sale on the street-stands Marsh Marigolds, *Caltha palustris*, have been very abundant and popular during the week past.

The so-called Lemon-scented Verbena, from the western coast of South America, *Lippia citriodora*, is said to have been among the earliest of the shrubs planted in the southern part of California, where it is now one of the most popular plants, and attains the proportions of a fair-sized tree.

This is the autumn of the year in South Africa, and fresh grapes are now arriving in London from Cape Colony in good condition and are selling by the box at one shilling a pound. Boxes of Louise Bonne pears, each containing thirty fruits, have sold at thirty shillings, at which price some one ought to realize a handsome profit.

Would it not be more satisfactory if retail florists were more particular in giving customers the true names of plants and flowers which they admire? In one of the most aristocratic shops of this city a beautiful plant of *Andromeda speciosa* attracted much attention lately, and visitors who inquired what it was were calmly informed that it was a Canterbury Bell.

Mr. H. J. Hale writes to the *Florists' Exchange* that in his three-year-old Peach orchard, in Georgia, every one of the hundred thousand trees is loaded with fruit, and some of them now carry ten times too many peaches for a full crop. Much of this fruit will drop about the time when the pits are forming, but, allowing for this, the indications are that the trees will have to be hand-thinned and at least three times as many peaches picked from them as are allowed to remain.

A correspondent of *The Garden* writes that one of the great attractions at the recent bulb show in Haarlem were some groups of Tulip species. The very early and showy *Tulipa Kaufmanniana*, mentioned in another column of this issue, is said to have flowers resembling some of the Magnolia-flowers while in bud, but opening white, yellowish toward the centre, with a dash of red on the outside. *T. violacea* is also very early, and has bright magenta-red flowers. *T. linifolia*, named for its narrow leaves, has flowers of a bright scarlet. *T. Batalini* has a pure soft yellow flower, which is small, but very pretty. The early Irises also were said to have attracted great attention. The best of those which will flourish in this country have been more or less mentioned in these columns by Mr. Gerard.

The first California cherries of this year reached New York on April 24th, one week earlier than last year. These were Black Tartarians. Since then small lots of the white cherry Rockport Bigarreau have arrived, but the fruit is small and unripe. Ten-pound boxes are offered at wholesale for \$2.50. Some extra large Porto Rico pineapples are offered at fifty to seventy-five cents each. Easter Beurre pears of large size bring \$1.50 a dozen, and selected Newtown Pippins, from Ulster County, in this state, sell for \$1.50 a peck basket. Large bunches of Almeria grapes sell at the rate of fifty cents a pound, and Black Hamburg grapes, from Rhode Island, at \$3.00 to \$3.50 a pound. Strawberries, from Charleston, of fine color and flavor, said to be Hoffman's Seedlings, sell for sixty cents a quart.

Messrs. Ellwanger & Barry send us an extract from a letter which one of their customers has written to say that small plants of the Crimson Rambler Rose, in two and a half inch pots, set out in the open border last autumn, have stood the severe weather without any mulch, and are now beginning to make a good growth. This was in a climate where the thermometer fell to six degrees below zero during the winter, with much alternate freezing and thawing, and this speaks well for the hardiness of the Rose. On the other hand, we have a letter from Herr Max Leichtlin, who states that at Baden-Baden,

where the temperature once dropped to five degrees below zero, and at another time to eight degrees, the wood of the Crimson Rambler became brown, and the buds of these shoots are not starting as well as they should. The fact that strong shoots are coming up from the roots seems an additional proof that the exposed branches at the top had suffered very much. Herr Leichtlin adds that it ought to be said in favor of the Rose that last summer and autumn were extremely wet and cool, so that the wood did not ripen as well as it would naturally be expected to do in our hot and dry climate.

In the April number of *The Chautauquan*, Mr. Sidney Weyman has an interesting article on the German Forest, in which he points out that the value of the forest in its relation to climate and health is more fully appreciated in the German Empire and in Austria than in any other countries in the world. Its important place in the national economy is seen from the fact that the forests give employment to a quarter of a million of persons, and yet, more remarkable still, is the sentiment of affection and pride with which the people regard the forest as the dominant feature of the country. The forest has always played a great part in the history of the German people. In the early centuries the Germans were born and bred in the woods, and the forest still has a hold on the imagination of the people as a place of refuge and shelter and a home, a sentiment which we look for in vain among any of the Latin nations. The Frenchman retires for rest to the water-side, but the German seeks change of scene among picturesque forest sites, where the pure air is supposed to bring health and relief from all bodily ills. Week after week the nerve-racked German will spend whole days from morning till sunset in the woods. Many of the people have little taste for fashionable life and take their holidays in out-of-the-way nooks and corners, living in solitary forest inns and cottages for weeks together. Notwithstanding the enormous growth of the German towns the national love of the forest seems to have become more intensified. In the winter there are sleighing-parties in the woods, and at Easter and Whitsuntide the forests swarm with tourists, and the school youth of Germany make long pedestrian journeys through them in the spring. The rifle clubs and singing clubs of every town meet in the nearest wood, and to provide for these various festivities there are any number of excellent inns scattered throughout the length and breadth of the forests. Bismarck lives in the midst of an old Saxon forest, and the Germans love to erect the monuments of their great men amid forest solitudes. A great portion of the poetry and literature of the country is connected with the forest, and from Schubert's songs to Wagner's operas their music is saturated with forest sentiment, their dramas are set in forest scenery and deal primarily with forest life.

Kale, spinach and lettuce comprised the principal greens of the winter season, and these are still offered, with dandelion, tarragon, sorrel, beet-tops, mint and clumps of chives. Large quantities of radishes are coming from Norfolk, peas from Charleston and Savannah, and string-beans from Florida. Asparagus of excellent quality is being forwarded from points between South Carolina and New Jersey. The grade from Charleston known as Extra Fancy brings sixty cents a bunch, and choice asparagus from southern New Jersey costs fifty cents. New celery from New Orleans brings fifty cents for three stalks. Egg-plants from Florida are rare, and small ones command forty cents each. Crook-neck and green squashes cost ten to fifteen cents each. New potatoes from Florida are somewhat higher than those from Bermuda, and bring sixty cents a half-peck. Peppers from Cuba bring seventy-five cents a dozen, and okra, from the same place, ten cents a dozen. Hot-house beets from Boston cost twenty cents a bunch, those from Florida and Bermuda bringing nearly as much. Carrots, cauliflower and long English frame cucumbers also come from northern hot-houses. Mushrooms at eighty-five cents a pound, cranberries at twenty cents a quart and French artichokes at twenty-five cents apiece are among other staples on the best-stocked vegetable-stands. The superiority of vegetables carefully grown under glass over those which are grown out-of-doors in the south is seen in the fact that cucumbers from Louisiana and Florida are worth ten cents each, while those from Boston hot-houses command fifteen cents each. Tomatoes from Cuba, Florida and Bermuda are worth thirty-five cents a pound; those from northern hot-houses command twice that amount. What with modern skill in growing vegetables under glass, and increased means of transportation, it is now possible to find almost any vegetable in New York at any season of the year, with the exception of sweet corn.

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TABLE OF CONTENTS.

EDITORIAL ARTICLE:—Nature and American Literature	PAGE.
Conifers in the West	Professor Charles L. Knobell
The Saguenay Region.—I.	R. H. Thal
What is a Cantaloup?	Professor F. A. Waugh
New or Little-known Plants:—An Arizona Agave. (With figure.)	184
PLANT NOTES:— <i>Cercis Canadensis</i> .	185
CULTURAL DEPARTMENT:—The Munson Grape Trellis... Professor F. A. Waugh	186
Kerosene Attachment for Knapsack Spray Pumps. (With figure.)	Howard E. Weed
Insect Pests	J. O. Orpet
About Daffodils	G. N. Gerard
Plants for Bedding	William Scott
Notes from Baden-Baden	Max Leichtlin
CORRESPONDENCE:—Fall Planting for Sweet Peas	S. 1
Notes from West Virginia	Dinske Dandridge
RECENT PUBLICATIONS	187
NOTES	188
ILLUSTRATIONS:—A View of the Foot-hills of the Huachuca Mountains, Arizona, with <i>Agave Huachucensis</i> in the foreground, Fig. 28.	185
Improved attachment for using kerosene with Knapsack sprayers, Fig. 29.	187

Nature and American Literature.

EARLY in the year Messrs. Harper & Brothers published a book, by George William Curtis, entitled *Literary and Social Essays*. These essays, gathered by Mr. Curtis's literary executors from the various books and periodicals in which they were first published, extend over a period of nearly forty years. The sketches relate chiefly to the group of great Americans who were life-long friends of the distinguished author. Though Mr. Curtis was with us only yesterday, his recollections run back for half a century, and, therefore, in these reminiscences, we are brought face to face with the noble men who have given to American literature its chief distinction. And as under Mr. Curtis's sympathetic presentation Irving, Bryant, Thoreau, Emerson, Holmes and Longfellow pass in review before us, each in his habit as he lived, we cannot but feel that never did any group of men more thoroughly exhibit the true sanity of genius. The most pessimistic critic can find no trace of aberration in any of them, except in the unbroken spiritual solitariness of Hawthorne, or in the rigid adherence to a noble but somewhat impracticable ideal which set Thoreau forever apart from his fellow-men. Strong in moral purpose, self-reverent, self-controlled, these men have the rare distinction of having ennobled literature as much by their lives as by their works, and Mr. Curtis is of their kin. He had the same strong moral convictions, the same deep patriotism, and though he lacked the creative faculty, his critical gift was of a high order, and his literary style, even in his lighter work, has that unmistakable accent of high breeding which must be forever the despair of the mere dilettante in literature.

It rarely comes within the scope of GARDEN AND FOREST to take note of a book so purely literary in its quality as this. But Mr. Curtis, in his interpretation of the work of his great contemporaries, has so clearly, though perhaps unconsciously, revealed the ennobling influence upon thought and life, of a right love of nature, that we feel impelled to add a word of comment on this special topic. In all these men of New England birth, including Mr. Curtis himself, we note that, combined with their stern moral rectitude,

and having its root, perhaps, in the same source, was a deep and genuine love of nature, in which we trace the same earnest simplicity and sanity that marked their lives. And, as our attention is for the moment recalled to the work of these early interpreters of nature, we cannot but remark that they struck a deeper and fuller note than is sounded to-day by even the most sympathetic observers of the beauty of our fields and woods. Unlike some of our modern writers, who complacently accept the title of "High-priest of nature," these sincere men did not seek her solitudes primarily to make notes for a magazine article, or even for simple rest or recreation, but for spiritual strength and sustenance. Thus they always wrote with reverence of the beauty of the outward world, and in their work there is no trace of the petty egotism or of the restless craving for sensation which mars many of the so-called nature-records of this more flippant age.

This sensitiveness to the profounder influences of nature and to what may be called its spiritual beauty is most strongly marked in the men of Puritan descent, as if out of the strong had come forth sweetness, and it is conspicuous very early in the literature of the country. Mr. Curtis tells us that the school readers of half a century ago contained two poems which every boy and girl read and remembered. One of them was Bryant's "March," the other was Longfellow's "April," and though the curious reader may find in the first a more vigorous love of nature, and in the other a more tender tone of tranquil sentiment, both deal with the sights and sounds and suggestions of the American landscape in the early spring, and the chord, so lightly touched by the young poets, slowly swelled into rich harmony in the imaginative prose of Emerson, Thoreau and Hawthorne, the noblest of the group. In Thoreau this enthusiasm for nature was combined with a stern moral purity; in Hawthorne, with a rich, though sombre, imagination, and in Emerson, with a noble and serene philosophy, but in the moral fibre of all the three was the granite strength of the New England hills, and to their inspired imaginations the tranquil scenery about Concord was a symbol of the repose and balance and harmony of the universe.

In treating of Irving, Mr. Curtis brings us at once into a lighter, but still a wholesome, atmosphere. Irving, true son of the city that has always been cosmopolitan, cared for nature chiefly in its relation to humanity, and, though not indifferent to the grandeur and varied beauty of his native land, loved best the rippling landscape of England, made exquisite through cultivation, and in America the picturesque banks of the Hudson, which he has forever made his own by the right of the eminent domain of the imagination. The charming legend of Rip Van Winkle is, in Mr. Curtis's view, the more remarkable and interesting, in that, although the first American creation, it is not at all characteristic of American life, but, on the whole, is a quiet and delicate satire upon it. So, perhaps, it is to our credit that we love the kindly vagabond who asserts "the charm of loitering idleness in the sweet leisure of woods and fields against the characteristic American excitement of the overflowing crowd and the crushing competition of the city." Mr. Curtis, too, makes the acute observation that it is to the author of the *Sketch-book* and *Bracebridge Hall* that we owe the conception of rural England, whose charm yearly draws such hosts of American pilgrims to her shores. Only an American could have seen England as he described it, and invested it with an enchantment which the mass of Englishmen had neither suspected nor perceived.

Mr. Curtis's own attitude toward nature can best be noted in the essays which treat of Hawthorne and of Emerson. In these papers he has given us a description of Concord and its surrounding neighborhood, which is marked throughout by exquisite poetic feeling and the most delicate appreciation of its strangely tender beauty. Not only does he manifest deep insight into the profound significance of nature, of which its outward beauty is but the sign and symbol, but his ear is quick to catch the true note wherever

it is sounded, and in the very year that *Walden* was published he writes :

Thoreau's instinct is as sure toward the facts of nature as the Witch Hazel toward treasure. If every quiet country town in New England had a son who, with a lore like White of Selborne's and an eye like Buffon's, had watched and studied its landscape and history, and then published the result as Thoreau has done in a book as redolent of genuine and perceptive sympathy with nature as a Clover-field of honey, New England would seem as poetic and beautiful as Greece.

His interpretation of Emerson is, perhaps, even more sympathetic :

The imagination of the man who roams the solitary pastures of Concord, or floats dreaming down the river, will easily find its landscape in Emerson's pages. His writings have no imported air. If there be something oriental in his philosophy and tropical in his imagination, they have yet the strong flavor of his mother earth, the undervived sweetness of the open Concord sky and the spacious breadth of the Concord horizon.

Conifers in the West.

THE only conifer that can be readily grown in the west, in addition to the Pines already discussed in this series, is the Red Cedar, *Juniperus Virginiana*. It is found native along the Kansas, the Niobrara and other western rivers, and thrives in the dry ledges that border the streams. It is too slow a grower, however, to be an attractive species to the western planter unless he desires it to increase variety in his grove.

The European Larch was given a thorough trial at the South Dakota Agricultural College, where trees three to six inches high were grown for a year in nursery, and then set with Box Elders. During the first three years they made only a sprawling growth, the laterals being stronger than the leader; then they began their upright growth, and in the course of the next two years assumed their normal shape. But last spring they were almost completely ruined by a late frost. The Larch leaves out very early, so that when late frosts are apprehended it had best not be planted.

The Red Pine, *Pinus resinosa*, ought to be as desirable a tree for western planting, but it has not been given a fair trial, probably because it is not commonly offered by nurseriesmen.

The Arbor-vitae is not a success in the dry plains. A hedge of it was planted along the front line of the Agricultural College campus at Brookings, South Dakota, in 1887. It was heavily mulched, and grew well the first year, but, in spite of good care, it gradually failed, and now scarcely a vestige of it remains. Last October I saw a small hedge of it at Denver, Colorado, in fine condition, but it had been thoroughly irrigated.

It is difficult, if not impossible, to assign the Spruces to their proper places in western planting. The White Spruce, *Picea alba*, is a native of the Black Hills, and specimens of it pulled from the woods in that region and set in the forest-plots at Brookings are now making a slow, but healthy, growth. They were twelve to sixteen inches high when planted in 1889, and the tallest is now three feet eight inches high.

In several towns in central Kansas, such as Hutchinson and Salina, one sees Norway Spruces on the lawns, but they are not at all common. At the home of Secretary Morton, at Nebraska City, Nebraska, a Norway Spruce of his planting is now about thirty feet high, and measures thirty-four inches in circumference at three feet from the ground. Douglas Spruce, *Pseudotsuga taxifolia*, and the Colorado Blue Spruce, *Picea pungens*, have been extensively tested at Franklin, Nebraska. They are grown until twelve to eighteen inches high under shade, and are then transplanted into open nursery rows. The Douglas Spruce did not stand the extreme drought well, not a single good specimen being seen during my visit in October. This Spruce was also quite extensively planted in the Sand Hill experiment of the Forestry Division in 1889. In inspecting these

plots in October last, a very few Douglas Spruce were found, but none looked as if they could survive another year.

The Blue Spruce has a much better record. Many sturdy young trees of it can be seen at Franklin, and there are remarkably fine specimens to be seen in the cemetery at Nebraska City, and at Salina, Kansas, while it is the most common ornamental tree in the lawns of Denver, Colorado. It is a very slow grower in the plains. The trees at Nebraska City are not more than one-third as high as a White Pine on the same lot, and evidently planted at the same time. The Denver trees have the advantage of irrigation. This Spruce varies greatly in color, specimens having a heavy bloom on the foliage being counted particularly valuable for ornamental planting.

It may be that one of the Spruces named may succeed when planted in the shade of Pines, as the species are shade-enduring, and this probably accounts for their poor growth in the intense light and heat and drought of the plains.

A few specimens of Balsam Fir, and very rarely, toward the south, Silver Fir, complete the list of conifers seen in the west. For general planting the Pines must take the lead, and of these, *Pinus ponderosa* and the Scotch Pine are probably the most promising.

Washington, D. C.

Charles A. Keffer.

The Saguenay Region.—I.

THE gorge through which the Saguenay River flows is one of the natural wonders of the world. The deep stream winds but little, and its appearance is much like that of a narrow lake. The cliffs which wall it in are so steep and lofty that one who steams over its surface rarely catches even a glimpse of the country which stretches away from their tops. Ninety miles from the mouth of the river the gorge divides, the main part going on to Chicoutimi, the other extending a few miles south-west and forming Ha-ha Bay. At the head of the bay the rocky barrier is broken or worn away, and a wooded and grassy slope comes down from the higher land. Two rivers, the Ha-ha and the Mars, rush down the slope with many rapids and waterfalls, while smaller streams hurry into the bay through narrow gorges. At the mouth of the Ha-ha stands the village of St. Alexis, or Grande Baie, and by the mouth of the Mars, St. Alphonse, or Bagotville, the former names being most in use with the French Canadians. St. Alphonse is the principal landing-place for steamers, and is most picturesque in situation and surroundings, the rocks rising abruptly immediately behind the village. The heights above offer delightful views of the bay, and command a wide expanse which is bounded in the distance by low mountains, with an opening down the river. This village I selected as a place of rest and recreation in the month of August, making excursions into the surrounding region on foot, by boat, or by means of that universal vehicle of the rough country, the buckboard wagon. A shorter stop was made in the early part of September at Tadousac, near the mouth of the river, with a brief stay at Chicoutimi.

Aside from the scenery, in which the sublime and the beautiful are charmingly mingled, the region provides a varied field for botanical work. Along the sides of the bay the gneiss and granite rise in massive cliffs and ledges, or form low ridges which stretch away from the shores. Though frequently bare, many of them show characteristic rock vegetation, while others are more or less abundantly covered with Fir, Spruce and Pine. Back of these rocks, and overlying them as they extend away from the river, are clay lands, into which the streams have cut deep valleys, bordered with hills and bluffs along the watercourses. The clays are subject to extensive landslides, which considerably change the contour of the hills when of recent occurrence. They provide a good soil, and where they overlie the country is the principal farming region. Back of these and at a higher level are sandy lands, interspersed with Pine plains, with their characteristic plants. Only a few miles away are numerous small lakes, abounding in

trout and aquatic vegetation. There are many swampy areas, and springs are everywhere abundant.

The prevalence of Coniferous trees was to me the marked feature of the forests. What remains of the woods on the clay land is largely made up of deciduous trees, and this, to some extent, is true of gravelly and sandy land. But the Hemlock is commonly interspersed with them, with Tamarack, Fir, White Cedar and Spruces occupying boggy areas. The deciduous trees are chiefly the Canoe, the Yellow and the Cherry Birch, the White Elm, the two Poplars (*Populus tremuloides* and *P. grandidentata*), the Black Ash, the Red and the Sugar Maples. Among smaller trees are the Mountain Ashes, *Pyrus Americana* and *P. sambucifolia*, which, in rocky localities, are often reduced to shrubs, fruiting at the height of four or five feet. The Alders are among the most plentiful of shrubs, *Alnus viridis* growing in the rocky woods and on the ridges, while the Speckled Alder forms dense thickets by watercourses and in swamps, sharing the ground with various Willows, the Sweet Gale and different kinds of Cornel. The last are common in the soils of all land adapted to their growth, as well as species of Viburnum belonging to more northerly regions. The Staghorn Sumach and the Beaked Hazel-nut were frequently seen, bordering the woods or making clumps of bushes in the open fields. The Striped and the Mountain Maple bushes line the sides of ravines and hang over the streams, or are interspersed among the trees which cover the steep slopes.

The White and the Jack Pine were the only Pines noticed. They are mostly confined to the sandy or gravelly land, or are scattered about on the rocky ridges. *Pinus Banksiana* is abundant in the poorest soil, forming Pine Plains in the sand. In such localities it is usually a low bushy tree, becoming a mere shrub on the rocks, where it can root in the scanty soil of some crevice or cling to a narrow shelf. The Arbor-vitæ, growing in the thin soil of some of the ledges, also forms a shrub of straggling habit, spreading over the ground to a distance of two or three feet from the stem, and fruiting freely when but a foot or two high. In the areas of rock by the shores of the bay the Coniferous trees are often curiously intermingled. The water trickling from seams and crevices has given rise to growths of Sphagnum and other mosses, which furnish a soil in which the different kinds take root. Here the White Pine, the Larch, the Fir and the Spruce are in such close relations that their branches touch each other. Their differing shades of green are admirably shown by this proximity, and offer a picture that is always charming.

But little merchantable White Pine is left in the vicinity. It has all been appropriated by the lumbermen or destroyed by fire. The logs at the mill in St. Alexis, the only one which remains in use on the bay, were all from quite small trees, some barely eight inches in diameter. At Chicoutimi I found large mills supplied by the forests of the upper Saguenay and its branches, and which furnished its principal industry. Here many of the logs were larger, showing more available material, though much smaller on the average than those of the forests of the Great Lakes and the Alleghanies. The smaller logs were largely cut up into "deals" and "battens," planks four to six feet long and six to eight inches wide. They were principally for export to distant lands, many, I was told, going to Australia. Being quite free from knots, they make good material for all articles to which lumber of such small dimensions is adapted.

Chicago.

E. J. Hill.

What is a Cantaloup?

THERE is a dearth of distinctive terms at command for the classification of our rapidly multiplying varieties of garden vegetables. Every effort should be made to fix with clear definitions the few which we do have, and to discourage every tendency to their incorrect use. As new vegetables appear they too often receive incongruous or

unintelligible names, and the nomenclature of this class of plants has become almost intolerable.

One of the good words, now badly mistreated, is the term cantaloup, as applied to a group of muskmelons. As used at present the term is of doubtful signification. In the south it is applied generally to all muskmelons. Certain well-informed horticulturists of southern experiment stations have issued bulletins on cantaloups, and they include under this head all the varieties of muskmelons. According to a limited acquaintance with southern people, the term cantaloup, when applied more closely, means a muskmelon of the Nutmeg class, small, globular, netted and green-fleshed. In the north, cantaloup means just the opposite; that is, a large, ovoid, rather smoother, yellow-fleshed fruit. The varieties bearing the names Cantaloupe, Improved Cantaloupe, etc., sent out every year from northern seedsmen, are of the latter description.

Probably the term is incorrectly used in either case, though its application to the small, netted, green-fleshed melons, is doubtless farthest from propriety. Naudin, whose work I do not have at hand, is quoted by Bailey* as "the most excellent authority upon the cucurbits," and from him Bailey adopts the following definition of Cantaloup (spelling it Cantalopé), placing this group first among nine cultivated groups:

"Cantalopes, *Cucumis Melo*, var. *Cantalouensis*, are characterized by hard and more or less warty, scaly or rough skins, and they are often deeply furrowed or grooved. The name is derived from *Cantaluppi*, a former country seat of the Pope, near Rome, where these Melons were early brought from Armenia."

Vilmorin and Andrieux† use the word with much the same definition, but spell it Cantaloup. They say: "There are numerous classifications of melons. Of these we shall follow the simplest and most common one, which divides them into two groups of the Netted and the Cantaloup or Scabby-skinned melons." Nicholson‡ says: "The Cantaloup melon has a remarkably irregular surface, and both the skin and flesh are irregular in color." Funk and Wag-nalls § give a definition which is clear enough, but somewhat confusing when considered with those cited: "A variety of Muskmelon having a yellowish or pale green skin and reddish flesh." In connection with this definition they give a quotation from F. S. Cozzens || which bears directly on the discussion in hand. He says: "You call all kinds of melons Cantalopes in Philadelphia, but permit me to say that it is a local error." The definition of *The Century Dictionary* is as follows: "A variety of Muskmelon somewhat ellipsoidal in shape, ribbed, of a pale green or yellow color, and of a delicate flavor." *The International Dictionary* says: "A Muskmelon of several varieties, having when mature a yellowish skin and a flesh of reddish orange color." In *Murray's New English Dictionary* Cantaloup is defined as "a small, round, ribbed variety of muskmelon of a very delicate flavor."

Looking over these definitions one will be struck first by the general uselessness for scientific purposes of those given by the dictionaries. All of the dictionary definitions, especially that of *The Century Dictionary*, seem to lean to that description of fruit spoken of as coming from the seeds of northern seedsmen. On the other hand, the definitions of Nicholson, Vilmorin and Bailey substantially agree that a cantaloup is "a hard, and more or less warty, scaly or rough-skinned melon, often deeply furrowed or grooved," and quite definitely to be separated from the netted varieties of the Nutmeg type. It is worth remarking that these concurring authorities represent France, England and America. Unquestionably this definition ought to be accepted. Surely our horticulturists ought to agree on something and save to us this needful classificational term.

* Bailey: *Some Muskmelon Botany*, *American Gardening*, vol. xiv., p. 206.

† *The Vegetable Garden*, English edition, p. 3.

‡ *Dictionary of Gardening*, vol. II., p. 350.

§ *Standard Dictionary of the English Language*.

|| Cozzens, "Sparrowgrass Papers," ch. x., p. 134.

Regarding the spelling of this word there is also some doubt. The following are given: Cantaloupe, cantaloup, cantaleup, canteloup, canteloupe, cantalope, cantelope. Nicholson, Vilmorin and De Candolle, who follows Naudin, agree in spelling it cantaloup, and the weight of authority is certainly with this spelling. However, the spelling is not of so much importance to us as the correct use of the word.

Oklahoma Agricultural College.

F. A. Waugh.

New or Little-known Plants.

An Arizona Agave.

NO group of North American plants, with the exception, perhaps, of the Cacti, is more difficult than the Agaves to understand from specimens preserved in herbaria; and not much light is thrown upon these plants by the occasional isolated individuals which drag out a more or less miserable existence in the confinement of northern glass-houses. Much confusion naturally exists in the identification of plants which have been named for the most part from half-grown and often flowerless individuals in European gardens, and it is more than probable that the same species often appears in books under numerous names. There are no plants, however, that are so well suited to produce certain effects in the garden, especially in countries warm and dry enough to enable them to flourish in the open ground; and it is desirable from the horticultural as well as the botanical point of view that they should be studied under the most favorable conditions. These can only be found when all the forms of the genus planted side by side in some favorable region carefully selected for the purpose are studied by a competent botanist in all their stages of development. This is the only way the limits of the species can be determined and their synonymy satisfactorily settled. The astronomical observatories of some of our universities establish posts of observation in remote countries in order to study certain phenomena of the heavens under the best possible conditions, and the great scientific gardens of the world might in the same way increase their usefulness by establishing in regions of peculiar climates collections of certain groups of plants which cannot be studied in herbaria, or under the artificial conditions afforded by glass-houses. For example, all the Agaves, Dasylirions, Beaucarnias, Yuccas, Nolinias and Cacti would grow to perfection in a garden in southern New Mexico or Arizona, and in such a garden a good botanist would be able to learn, in the course of a few years, more about these plants than has ever been learned before. Agaves will never be known until this method is adopted, and Cacti certainly will not, for a Cactus in a pot rarely fruits, and often changes its appearance to a degree that makes it unrecognizable. For the satisfactory elucidation, therefore, of the flora of northern Mexico and the adjacent parts of the United States, where such plants are the conspicuous and most interesting features of the vegetation, a well-equipped local station is essential, and we hope some day to see this plan put into operation. In the mean time, labor expended in herbaria on the study of the plants we have mentioned is practically thrown away, as it can only be partial and never final.

There are not many species of Agave that grow spontaneously in the territory of the United States, but some of these are very beautiful. One of these species appears in the illustration on page 185 of this issue, made from a photograph, for which we are indebted to the courtesy of Mr. J. G. Lemmon, the well-known botanist of Oakland, California, who secured it on the foot-hills of the Huachuca Mountains, in southern Arizona, where this plant grows in large masses, usually along the upper edge of the mesa and below the forests of Live Oaks which clothe the lower slopes of the mountains and appear in the background of Mr. Lemmon's picture. We suppose the species to be *Agave Huachucensis* of Baker. It resembles, however, in

many respects the *Agave applanata* of Lemaire, and is not readily separable from Engelmann's *Agave Parryii*, which, in its young state at least, is not always distinguishable from the *Agave Palmeri* of the same author, or from a species of western Texas into which, perhaps, this plant also ranges. The name, however, is not important for our purpose, which is to call attention to a very beautiful plant which seems to be still little known in cultivation.

Plant Notes.

Cercis Canadensis.

THIS, our native Red Bud, is one of the most beautiful of the small trees which enliven with brilliant flowers the sylvan scenery of eastern North America. The flowers of all the species of *Cercis* are rosy pink, and are produced before the leaves in clusters or short racemes which cover the branches, and sometimes appear also on the trunks, so that when the trees are in flower they are masses of color. West of the Mississippi River, especially in some parts of Missouri, in the Indian Territory and southern Arkansas, the Red Bud is so abundant that it lights up the whole landscape during the month of April, when a journey through that region is a perfect delight for the lover of flowers. The beauty of this tree, too, is often heightened by the contrast of its rosy pink flowers with the pure white flowers of one of the Hawthorns, *Crataegus mollis*, and with those of the Flowering Dogwood, these trees frequently growing and blooming together.

The Red Bud, although it does not grow north of the valley of the Delaware River, in New Jersey, is perfectly hardy in New England; it is, moreover, an admirable garden-plant; and it can be used with the best possible effect against a dark background of conifers, which serves to bring out the beauty of its flowers. Although under favorable conditions it sometimes becomes a tree fifty feet high, the Red Bud begins to flower when only a few years old, and in good soil it grows with great rapidity.

The *Cercis Siliquastrum*, of southern Europe, has rather larger and more brilliant flowers, but, unfortunately, is not hardy in the northern states. A Chinese species, *Cercis Chinensis*, is a rather low shrub with large deep-colored flowers, which is often cultivated in the neighborhood of this city and Philadelphia, although farther north it is not hardy. This plant is often found here under the name of *Cercis Japonica* because it was first brought to this country from Japan, where it has long been a favorite garden-plant. The other species of *Cercis*, of which two are American, one Texan and the other Californian, are not in cultivation. But probably no other member of the genus is as valuable in our gardens as the eastern American species. It is one of a group of early-flowering small native trees which ought to be generally planted in our parks and large pleasure-grounds to brighten in early spring the borders of woods and give color and variety to the landscape at the time when most deciduous-leaved trees are bare of foliage and flowers are most appreciated. The Flowering Dogwood is one of these trees and the native Crab-apple is another; all the Hawthorns and the arborescent Viburnums can be used in this way.

All these trees harmonize perfectly when planted together, and never appear out of place in the composition of an American park picture. They belong to our flora, and so do not produce a discordant effect when they are used in the foreground of an American landscape, while an exotic plant equally beautiful in color and habit, like the Lilac, for example, gives, when used in this way, an effect of unrest and unsuitableness which, although difficult, perhaps, to explain, is, nevertheless, real. Fortunately our American flora is so rich and varied that the makers of park landscape who may desire to produce natural sylvan effects here are not obliged to have recourse to foreign lands for their material. Our woods can supply them with all the plants they need, and the best compositions for

study, and if they study Nature faithfully they should be able to produce the best results that are obtainable in this country. Exotic plants are often very beautiful, but the best of them, whether they come from Japan or China, Europe or the Orient, look strange and out of place in a truly American sylvan scene such as the park-maker, who makes the most of his opportunities, should try to produce for the weary workers in American cities.

SALIX CANDIDA.—As yet little attention seems to have been paid to the cultivation of Willows for the commercial value of their flowers. It is well known, however, that bunches of Willow-catkins are sold in great quantities in our cities every spring. The supply is usually drawn from wild natural plants, but it is possible that a well-managed plantation would yield a fair profit from soil that would be otherwise of little value. The earliest-flowering and largest and most showy-flowered varieties ought to be selected, of course, and for this purpose *Salix candida*

white tomentum which covers the ovaries, the latter being tipped by dark red stigmas. The twigs and the under surface of the leaves, and the upper surface when young, are covered by a dense white tomentum, giving the plant a grayish or hoary aspect, on which account the common name of Hoary Willow, or Sage Willow, has been given to it.

ANDROMEDA SPECIOSA.—A few well-flowered examples of this species were on sale in the leading florists' establishments of New York at Easter, and although these Andromedas are native shrubs found on borders of ponds all through the coast country, from Florida to North Carolina, they were novelties to most people who saw them. *A. speciosa* certainly rivals many of the finest Heaths when it is forced, with its pure white, bell-shaped flowers, sometimes half an inch long, borne on the naked branches formed the year before. When plants have been once forced, if they are kept in pots during the summer they will flower more freely the next year than they did the first season



Fig. 28.—A View of the Foot-hills of the Huachuca Mountains, Arizona, with *Agave huachucensis* in the foreground.—See page 184.

might not prove so profitable as some others, like *S. discolor* or *S. humilis*, compared with which it is a very small and much less vigorous plant. On account of the peculiar beauty of its blossoms, however, it is worth having in any collection of shrubs. Ordinarily, in its native cool bogs and swamp ground, this Willow is a straggling-stemmed plant from two to four or five feet high. Transferred to the drier ordinary ground of gardens it thrives very well, although not inclined to assume the neat, compact, bushy habit desired by many planters. The peculiar interest possessed by this species over its numerous congeners lies in the pretty pink or rosy red color of the stamens in the male plant. These stamens are tipped by red anthers, which, as they open to shed pollen, are changed to a bright light yellow color. The catkins are from half an inch to an inch in length and rather globose in outline when in full flower. On the female plants the catkins are more slender and they have a hoary white appearance, on account of the soft and dense

after they were taken from the open ground. But, although the natural home of this plant is in the south, it will survive the winters as far north as New England. Since the buds are formed in the autumn on the terminal shoots the wood does not always get well ripened in moist seasons, and, therefore, it is well in exposed situations to peg down the branches and cover them up. It is practically hardy, however, and one of the very best of our dwarf-flowering shrubs. It grows from two to four feet high, has a neat and compact habit, with shining light green leaves, which hold their color late into autumn, although they sometimes change to yellow, brown or purple. It was a popular plant in England early in the century, and we see complaints in the English horticultural papers that it has of late years been neglected, but it is doubtful whether it is any more rare in England than it is here. There is a variety known as *Pulverulenta*, which is a still more dwarf plant and somewhat neater, with bluish gray or chalky white leaves, which are covered with a dense bloom. Although *Andromedas* are

Ericaceous plants, peat soil is not necessary for either the species or the variety, and they will both do well in any soil which is not too dry. They propagate slowly from cuttings, the forced wood being best for this use; or they can be grown from seed, and the seedling plants will flower the third year.

Nymphaea Marliacea Ignea.—This new Water-lily, to judge from material sent by Mr. J. Brydon, is likely to be a first-rate addition to our hardy *Nymphaeas*. As noted in GARDEN AND FOREST last week, it is one of Monsieur Marliac's new series, and the plants noted are flowered here for the first time. It is superior to *N. flammea* and *N. Laydekeri* in size of flower and foliage, which is only slightly mottled. There is also a break away in the form of the flower and in the more numerous petals. The petals are a rich, deep magenta, self-colored, rather than a flame color or orange-red, as the name would indicate. The stamens, however, as in the other varieties, make a mass of orange. If the specimens shown are a fair indication, this variety, *Ignea*, out-classes *Flammea* in all respects, and would be the more generally valued of the two varieties.

Tecophilæa Cyanocrocus.—This bright little bulbous plant, which has survived several years in open borders near this city, seems to have found the last winter too severe for it in some gardens, for plants which were considered well-established have not appeared this spring. If this so-called Chilian Crocus has survived in the gardens of any of our readers we should be pleased to know something about its treatment. It has been classed among greenhouse bulbs, but we still have hopes that it may be useful in outdoor gardens with a little extra care. Perhaps it would be able to endure the cold if the bulbs were dried out thoroughly during the summer. The flower of *Tecophilæa cyanocrocus* is charming, standing erect, something like a Crocus, on a short scape, with six petals slightly spreading, about two inches long, and of the deepest gentian blue with white markings at the base. There are other species and garden forms of the plant, but the species of which we speak is hard to improve upon. Although introduced nearly twenty-five years ago it remains comparatively rare.

Cultural Department.

The Munson Grape Trellis.

THE propriety of using this term, the Munson trellis, has been questioned by a critic, who says that neither the trellis nor the system of training is distinct from other systems; that they are all Kniffin systems; that, at best, what goes by the name of the Munson system should be a variety of the Kniffin. It seems clear to me that the trellis and the training are distinct enough to bear special designations, and that the use of Mr. Munson's name is justified by the facts and sufficiently authorized by its recognition in Professor Bailey's *American Grape Training* and the last edition of the *Bushberg Catalogue*.

It may be well to explain, for those not intimate with this form of trellis, the construction used and advocated by Mr. T. V. Munson. According to this method the posts are made six feet high. At the top runs a cross-piece two feet long, at each end of which is fastened one of the wires of the trellis. Mr. Munson originally used two posts set in a V shape, with the tops two feet apart. The result is the same either way. Eight inches lower than the two side wires there is a third wire fastened to the posts. This brings the three wires into a very broad V shape. There are no other wires on the trellis.

The system of pruning, which forms a necessary part of the scheme, provides that one or two stems be brought up to the lower or middle wire, and that from these stems canes shall be run each way along this wire. From these canes the bearing shoots come at right angles, and naturally fall out over the top wires. Renewals are most easily made by spurring at the point on the lower wire, where the canes are given off from the main stem, though it is often a very easy matter to renew quite from the ground.

This system has been in use at the Oklahoma Experiment Station from the first, though that is not very long, and has given abundant satisfaction in most particulars. At the first glance those who are familiar with our severe winds, but not

with the working of this trellis, are much inclined to fear great damage from the whipping of the shoots, but, as a matter of fact, this serious difficulty is nearly overcome by the Munson trellis. It is one of the most vexing problems in the ordinary horizontal-arm training, but the increased height of the trellis does not increase the trouble. On the other hand, the peculiar position occupied by the growing wood gives it almost complete immunity. The green shoot is supported in two places near its base, while most of its length hangs free. Though it may swing in the wind, there is nothing against which it may strike, and so the damage is avoided.

Mr. Munson sets forth his ideas of the advantages of this system in Professor Bailey's *American Grape Training*, page 81. However, in our experience here, his summary is unsatisfactory. Some of the advantages which he claims do not seem to be peculiar to this system of training. Others are of slight importance. Those which are important ought to be more emphasized. In our experience the chief advantages of the system are (1) that it greatly reduces the damage from the wind; (2) that it reduces damage by heat reflection from the soil; (3) that it saves summer tying. The first of these advantages has already been explained. Regarding the second, it should be said that in this country, wherever bunches of fruit hang near the ground, they are usually more or less dried out by the excessive reflection of heat from the soil during hot summer days. The loss amounts to a great deal. A conservative estimate placed this loss at from ten to sixty per cent, through this country last season, and in some exceptional cases the crop was quite destroyed. With the fruit hanging five or six feet from the ground and overshadowed by a canopy of foliage at least two feet wide, this evil is evidently much mitigated. The young shoots do not need to be tied at all, but are left to swing freely from the support which is given at their bases. In most other systems summer tying is a considerable and expensive item. Some summer pruning usually has to be done, but this is much facilitated and probably reduced in absolute quantity by the Munson training.

Certain weak-growing varieties, like the well known Delaware, do not find this trellis adapted to their needs. Many other circumstances may decide against its use; but it is being widely adopted through this country, and there are many favorable reports from it in other states.

F. A. Waugh.

Kerosene Attachment for Knapsack Spray Pumps.

THE article of Professor Goff in GARDEN AND FOREST, April 10th, suggests a note on the improved form of a kerosene attachment to the knapsack sprayers which I have just perfected. A full description of this new apparatus is published in Bulletin No. 32 of the Mississippi Experiment Station, to which the reader is referred for any further details. Professor Goff made his first attachment to a Climax-pump, and in September of 1893 this attachment was given a trial at the station here. After ascertaining that the principle of the mechanical mixture of kerosene with water was correct, plans were submitted to the manufacturers and an attachment was made to the knapsack pumps.* For garden work, and, in fact, in most cases where we wish a mechanical mixture, excepting in orchards, the knapsack pump is undoubtedly superior to all others, and for this reason the attachment was made to this form of pump. The instrument reported upon by Mr. Marlatt, at the last meeting of the Association of Economic Entomologists, was this attachment to the knapsack pump, and his lack of success in no way affects the principle of the mechanical mixture. Previous to Mr. Marlatt's publication I had found two objections to the attachment: (1) The mixing of the kerosene and water in the pump when the stopcock is left open; and (2) the lack of graduation in the stopcock, so that the proportions in which the separate fluids were used could only be ascertained by first pumping the mixture into a graduated glass jar.

These objections, however, have been obviated in the new apparatus shown in the figure (see page 187). By means of two check valves at right angles to each other the kerosene and water are both permitted to go into the pump, but neither can go back, and so all possible mixture of the two liquids is prevented, except in the pump when operating. A brass gauge rod, which bends around to the side of the main tank, where it fits into notches on a gauge plate, is connected with the stopcock, the spring of the rod holding it firmly in place until charged by the operator. Each notch on the gauge-plate is plainly marked, so as to indicate the proportion which will be

* Bulletin No. 30, Mississippi Station.

pumped when the gauge-rod is placed in the different notches. Beginning at the top the notches read: $\frac{1}{10}$, $\frac{1}{9}$, $\frac{2}{10}$, $\frac{1}{8}$, $\frac{1}{7}$, $\frac{1}{6}$, $\frac{1}{5}$, $\frac{1}{4}$, $\frac{1}{3}$, $\frac{1}{2}$. That is, when the rod is at the bottom notch the stopcock is closed, and when at the top notch equal parts of kerosene and water will be pumped, and so on. The gauge-rod can be reached by the hand when operating, so that a change from one proportion to another can be readily made. Thus we have very nearly a perfect apparatus. Kerosene is a most valuable insecticide, and is always obtainable. In spite, however, of the oft-repeated statement that a perfect emulsion can be made by any intelligent farmer, the fact remains that nine-tenths of our farmers never really accomplish this, and this is why the emulsion has not been more generally successful.

We now know but little as to the number of injurious insects which can be successfully held in check by this kerosene attachment to the knapsack pump. Many entomologists assure me that they will give it a thorough trial during the coming season. For the benefit of any who wish to try this attachment, I would state that it is now being manufactured by the Deming Company, Salem, Ohio.

Agricult' College Experim't Station, Miss.

Howard Everts Weed.

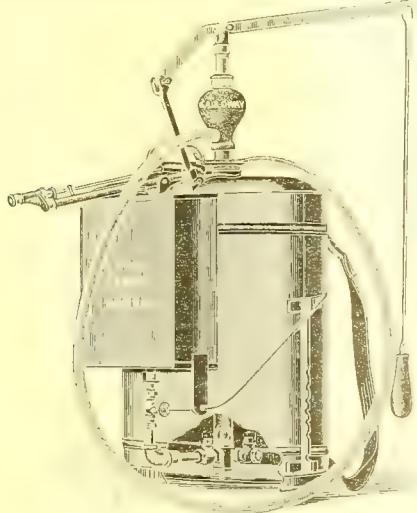


Fig. 29.—Improved Attachment for using Kerosene with Knapsack Sprayers.

Insect Pests.

NO one knows until he undertakes to cultivate the soil how many evils plants are heir to, and these seem to be on the increase. The insect pests, owing, presumably, to the survival of the fittest, seem to be more highly educated than of old, and it is only by continued watchfulness that successful crops can be grown. It seems to me, after a few years' study of this phase of garden routine, that insecticides are most profitably used as preventives. The process of fumigation is by no means the best method to adopt, especially with houses of mixed plants, such as are generally grown for gardens that exist for the pleasure of the owner, and not for commercial purposes. In the use of tobacco in its various forms as an insecticide we have a great advantage over European cultivators in that we can get an article good, cheap and pure in tobacco-stems fresh from the factory. That they lose much of their strength through keeping and exposure there is no doubt. If fumigation is necessary these stems should not be used, for there is too much heat generated for the amount of smoke given off. A cheap grade of damaged leaf tobacco has been found to be the best and cheapest for the purpose, for so little smoke to kill that it rarely has density or heat enough to burn delicate foliage. It is a long time now, however, since we used the smoke-pot, and this is due entirely to the scattering of the stems on the benches between the pots or on wire netting placed on the heating pipes. If used in the latter way, and damped occasionally, so as to give off a medicated vapor, hot water is almost as good as steam pipes as a vaporizing medium, and the stems will retain their strength for many weeks.

Those who have tried to grow Cinerarias and Calceolarias know how liable these are to the attacks of aphides, and how difficult it is to fumigate without damaging the plants. These plants furnish a striking proof that fumigation is not the best way to kill insect pests. It is barbarous to subject the plants to such an ordeal, to say nothing of the operator, when a sprinkling of stems around the pots, renewed two or three times during the season of growth, will quite clear them of insects, so that there is a real pleasure in growing the plants.

We have always had a great deal of trouble with what is known in common garden language as the Orchid thrips, a little white insect, barely visible to the naked eye, but which, before it is discovered, does great damage to the young foliage of plants. Cypripediums are happy hunting-grounds for these thrips, and there is no insecticide that I know that will check them except tobacco-stems liberally sprinkled between the plants. If badly affected it is well to sponge the foliage with an insecticide first to get rid of the older ones, and the young insects will be killed off as they hatch out. It is said that as the tobacco-stems decay a large amount of ammonia is given off into the atmosphere, producing a healthy green in the leaves, more especially of Orchids. I am of opinion that this is something more than a theory. By taking a bunch of tobacco-stems and damping them it will be found after fermentation sets in that a pronounced quantity of ammonia is given off into the atmosphere for the plants to breathe. While it might be possible to overdo the matter in the use of too much of the tobacco-stems at a time, I have never had this occur. If their use is not so plentiful as to cause an untidy look on the benches it is safe to say there need be no fear as to damage, and preventive measures are much cheaper than any others.

We have lately had for trial a new insecticide, known as Lemon oil; it is a preparation similar to that called Fir-tree oil, and acts in the same way when mixed with water, but we find that it is not so liable to do damage as the latter, and is of use for a greater variety of plants. There is no need to wash off the mixture from the roots of plants as it is said to be also a fertilizer of the soil.

Tobacco-dust is now put up by all dealers and is a most effectual remedy for aphides. This also is a fertilizer, and if it is necessary to give more than one dusting it will benefit the roots as well as kill the insects. There seems to be a great difference in the quality of this article as put up for sale. We were induced to buy a barrel of it once, the price being low when bought in bulk; this particular lot was practically worthless, and it is reasonable that pure tobacco-dust could not have been sold at the price paid. I have found that the coarser grades are the purest and the best to use.

A word should be said for that best of all insecticides, cold water with a good force behind it. There are few insects that can withstand this treatment, especially if the Stott sprayer is used. We have four of them in steady use, and plant-growing has been much simplified by this invention. When some means is devised for mixing the various insecticides with the water as it comes from the main, there will be little excuse for unhealthy insect-ridden plants in the garden. White scale insects on Orchids are usually very hard to eradicate, especially on Cattleyas, and these are often infested when brought in from their native woods. The Stott sprayer makes clean work, and does not injure even the young growing tips of the roots if used carefully. If the least trace of scale is noticed it is best to apply this cure at once, for it is surprising how rapidly this insect debilitates plants. It should, perhaps, be said that our water-pressure is over one hundred pounds as it comes from the main, but a much less force would be sufficient, though how little would be enough I am unable to say.

South Lancaster, Mass.

E. O. Orpet.

About Daffodils.

IT would be interesting to know which of the Spanish Daffodils are referred to by Mr. Orpet as not reliable in Massachusetts. The mountains of southern Europe, from Spain to Italy, are rich in Daffodils of many forms, and it might be expected that some of these would fail in other countries, although the cause of the failure might be something besides the rigor of our winters. Certainly *Narcissus major* and *N. minor* are as hardy as anything in the family, and many of the Ajax, or large trumpet section, which, though bearing fancy names, are collected and selected bulbs, bear witness to the general hardiness of the family. Outside of the Tazettas, which come from the lowlands, and the Bulbocodiums, which are mostly north African, the entire family is very hardy here and I can see no distinction in that respect between the species and the hybrids. White Daffodils are credited with being rather more delicate than the yellow kinds, but of these my experience is limited, having grown only *N. moschatus* and Mrs. J. B. Cannon, both of which hold their own with the other varieties, and the little white *N. triandrus* is quite as hardy and vigorous within its limits as *N. Emperor*. As the white of a *Narcissus*-flower is not necessarily due to lack of vigor, like the variegation of a leaf, there seems no reason why they should be weaker than plants of other colors. In the case of white *Narcissi*, which are not plentiful, and of other rare and expensive kinds, the trouble comes from the anxiety to do the very

best, so that they are placed in too rich soil, or in some other way they are coddled to death. A bad memory as to details of cost is a good thing in the garden, and with such a memory one is more likely to treat all his plants on rational principles, which means leaving them alone and trusting much to nature.

I understand that a moderate amount of well-rotted cow manure worked in the ground makes the best soil for Narcissi, and it is well, though not absolutely necessary, to set each bulb in an enveloping layer of sand. Owing to a lack of this or any other nutrient my bulbs do not throw very long stems, but I think the flowers are more purely colored than those which are better fed. Purity of color is of more importance to me than size or length of stem. Were space available I should move my Narcissi every second or third year to new ground, or to that on which some other plants had been grown, after manuring. As a matter of fact, if closely planted, they require such changes, if only to free them from crowded offsets. They will, however, live for years with little fertilizing and crowded to suffocation, and even among the roots of trees or plants through which they can scarcely force their leaves. I once found a colony of bulbs under a clump of perennial Phlox, which was at least three or four years old, and whose roots were so matted that it was necessary to cut them apart to extract the bulbs. They did not flower there, but as they were the double Poeticus they would probably not have flowered any way. This would indicate that plantings in the grass are perfectly safe. They certainly lead to satisfactory results, as the grass furnishes a charming foil at flowering-time. This practice, however, is scarcely to be recommended for small gardens. These, unfortunately, have their limitations, and among their limitations is the very unfortunate one that everything is too much in evidence or under one's glance. In a small garden one cannot get nice effects, like a glow of gold from Daffodils in the distance, or plant some of the little treasures deftly, so that one always finds them when in flower with a certain sense of discovery to heighten the pleasure. I wonder how many large pleasure-grounds there are in the United States which are planted with such natural art that the weary owner could find interest and instruction in every likely nook, shady corner or sunny slope, everywhere restful pictures, and nowhere any intrusion of work and evident expense. The current landscape practice seems to be the planting of masses of plants for great display of color, as if a person enjoyed being gorged even with beautiful colors. Masses of color have their uses if they are not too conspicuous or not so numerous that they intrude upon one from every point of view. But the charm of the garden is mostly found in the more modest pictures produced by some happy combination of form and coloring. Pictures there are often of which one only catches a hurried glance, yet they fill the eye and satisfy us with their beauty.

Elizabeth, N. J.

J. N. Gerard.

Plants for Bedding.

AS the season for bedding out is now fast approaching there is little time left for further propagation, but if the stock of such plants as Coleus, Ageratum, Alternanthera and other quickly rooting species is insufficient a few may yet be struck, and these will be found useful in places where small plants are required. Hardening off is a matter of the greatest importance for all of these plants, although it is often neglected. The work must be done gradually, or if the plants are suddenly exposed to outdoor conditions after being nursed up in a warm greenhouse they will receive a check from which it will take them weeks to recover. Where a house can be devoted to these plants alone the work will be greatly facilitated, as the temperature of the house can be gradually cooled down until full air is left on night and day. If a separate house is not possible, cold frames will have to be utilized. The plants will be quite safe in these any time after the first of May with a slight covering over the sashes on cold nights. One drawback to the frames is that they are only suitable for the smaller classes of plants. For large specimens, as Agaves, Yuccas, etc., space must be found in a cool house for a few weeks previous to their being set out, for, although seemingly robust, this class of plants is as apt to receive a check as a tender Coleus. The results of a chill, though not apparent at the time, would tell afterward in the discoloring and dropping of the bottom leaves. A sheltered corner should be selected, and all the plants placed in the open air at least ten days before they are intended to be planted, and some means devised whereby they can be slightly protected should the nights prove to be too cold. The time of planting must be regulated according to the hardihood of the plants used. For the more tender species, such as Coleus, Alternanthera, etc., the first of June is

soon enough to trust them in the open ground in this vicinity, but where a large amount of bedding has to be done it is often necessary to commence a little earlier.

Tarrytown, N. Y.

William Scott.

Notes from Baden-Baden.

AMONG Snowdrops I beg to mention *Galanthus Caucasicus grandis* as one of the very best; the color of the large flowers is the purest white, and healthy robust plants grow in any situation and any soil very evenly. *Colchicum Szovitsianum* and *C. luteum* deserve praise among the earliest harbingers of spring; the former has small bright pink flowers growing in bunches up to the number of twelve, and the latter is remarkable for its bright deep yellow flowers; I have raised a fine variety of it, the flowers of which are twice the size of the typical form. The early flowering *Hyacinthus ciliatus* (*Muscari azureum*) comes from the heights of Asia Minor in several distinct forms. Of these the varieties *Robustus* and *Amphibolis* are stronger growers, and the best of all is the variety *Freyianus*, the turquoise-blue of the spikes being very showy. *Chionodoxa Luciliae* is now coming on with pink and white flowered varieties, which are very pretty. A few years ago I introduced a variety of *Anemone blanda*, which I called *Scythinica*; it is a very distinct plant, its flowers being mostly of the purest white. It is quite a picture to see a clump of this in sunshine. *Fritillaria alpina* is a small but lovely species; the chocolate bells have a bright yellow rim which causes a beautiful contrast. All the above are quite hardy.

Baden-Baden.

Max Leichtlin.

Correspondence.

Fall Planting for Sweet Peas.

To the Editor of GARDEN AND FOREST:

Sir,—Do you consider it safe or desirable to plant Sweet Peas in the fall of the year? Will plants produced from autumn-sown seed have any superiority in vigor or in the size of the flowers over those planted in the spring? If autumn planting is desirable, at what time should the planting be made and how deep should the seed be planted?

Cambridge, Mass.

S.

Whether Sweet Peas can be successfully planted in autumn depends largely on the latitude. In the southern states fall planting is a necessity, for this is the only way to give the plants a cool soil in which to make a strong early root-growth. Coming farther north, fall planting is safe up to, perhaps, the latitude of Washington, where the chances are about equal between planting in late autumn and in February. In southern California Peas must be brought into bloom as early as February, although the nights are so cool there that they may be planted during any month in the year. The rule observed by the large seed-growers is to plant just ahead of the rainy season. Indeed, they have acres of volunteer Sweet Peas—that is, from seed which were scattered on the ground during the harvest, and forty-five miles south of San Francisco these volunteer plants are in bloom by the first of May, and often early in April.

Speaking for the northern latitudes of this country, I will say that I have never had or heard of any considerable success with planting Sweet Peas where the winters are severe. Certainly this practice has no advantage. Sweet Peas do not take kindly to forcing under glass, although the florists will get an apology for flowers considerably ahead of the regular reason. My attempts at outdoor forcing have not been encouraging. The month of May has enough chill in the air to hold back the growth and enable them to get strong roots.

It ought to be said that our Sweet Peas are not as hardy as those our grandmothers had. In improving the flowers the constitution of the plant has been refined a good deal. And then the seed is nearly all grown under milder conditions than our northern climate affords. California sends us the great bulk of this seed, and the English and French grown seed is, perhaps, less hardy still. These two facts—the higher development of the flower and the growing of the seed in a milder climate—have, in a measure, detracted from the old native hardiness of the plant, and, perhaps, it

accounts for the blight which now kills so many plants, and for the need we now have of more skillful cultivation, and both these conditions bear upon the subject of fall planting. No doubt, a little ingenuity may bring a short row into bloom a week earlier than the regular season, but it does not seem to me worth while for the ordinary amateur to pay for the extra effort. Fall planting will hasten the flowers very little, but a warm southern exposure, a break against the north wind, well-drained soil that will work early, and fertilizing material well mixed through it so as to be ready for immediate use, will help a great deal. I had a respectable exhibit of Sweet Peas at the Springfield Rose Show on the nineteenth of June last year, and my plants were then beginning to bloom abundantly. This was largely due to the preparation of the ground in autumn, and to liberal annual manuring by which easily digested food was ready for the plants as soon as they started. I am usually ready to exhibit Sweet Peas two or three weeks before the Massachusetts Horticultural Society fixes the date for the Sweet Pea Show.

I consider it a great advantage in Sweet Peas to grow slowly during the month of May. They are naturally thrifty plants and very easily take on a fast habit, in which case they run into rank growth of vine without a bloom. Early planting is a safeguard against this, so that the root-growth is made in the cool soil, while the plant grows slowly above ground all through May. Not until the first of June do we want them to make a very perceptible growth above ground, but then they ought to be pushing up at least a foot a week. Not until they make this rapid start should liquid-manure or soapsuds be applied. They are rank feeders and abundant drinkers, and after the tenth of June it is a joy to see them grow straight up six feet and send out a flower-stem at every joint of every branch.

Indian Orchard, Mass.

W. T. Hutchins.

Notes from West Virginia.

To the Editor of GARDEN AND FOREST :

Sir,—Of a dozen varieties of Japan Quinces that we have planted here the one called Mærtosii is the most beautiful. Its softly shaded blossoms of a lively carmine remain in bloom for many days after the flowers on the more common red one have faded. But it does not seem as robust as some other kinds, and last year, between the drought of summer and the extreme cold of winter, it had a hard struggle for existence, dying nearly down to the ground. This spring it has made good growth and sent up many shoots, but it will not bloom. The common-flowered red type, on the contrary, is blooming as profusely as usual. It is hard to get too many of these Quinces. Their compact growth, beautiful healthy foliage and profuse flowers make them useful in so many ways, as screens, as hedges, as groups and as individual specimens. A number of other garden-varieties besides Mærtosii have not bloomed this year, but Maule's Quince seems perfectly hardy. *Jasminum nudiflorum* has bloomed only on the lower branches, and on the ends of its pendulous shoots which sweep the ground, where a wind-heaped mass of Oak-leaves protected the buds.

There is one feature of the present season which makes it sadly different from any other spring in my memory, and this is the scarcity of birds. Usually at this time the grove and garden and the old orchard are jubilant with song from many sparrows, flocks of robins, numbers of blackbirds and blue-birds, redbirds, Carolina wrens and crested titmice. This year we have seen but one pair of robins on the place, and the other birds are proportionately few, except the blackbirds, and these are here in undiminished force. They must be among the hardiest of birds.

The extreme cold weather of the winter, which extended so far southward, must have overtaken the songsters in their winter retreats and slaughtered them by thousands. Even English sparrows, which I had considered proof against cyclones and blizzards, seem to have succumbed to the cold, as very few have ventured to invade our home-grounds this spring. This morning only one song-sparrow sang his matins under my window, and later a single white-throated sparrow has rendered at intervals his sweet monotonous chant, which seems to have more of pathos in it than usual.

Rose Brake, W. Va.

Danske Dandridge.

Recent Publications.

Les Fleurs de Pleine Terre. Vilmorin-Andrieux & Co. Fourth edition. Paris, 1894.

More than thirty years have passed since the first edition of this work appeared. From that time until the appearance of this much enlarged edition the authors have lost no opportunity to improve and enlarge it, and in the fourth edition will be found a manual of hardy plants indispensable to every one interested in their cultivation who is master of the French language. The value of this work in its present form is much increased by a number of plans of gardens prepared for it by Monsieur Edward André, the distinguished landscape-gardener. In this handsome volume, which covers nearly fourteen hundred pages and is profusely and capitally illustrated, the student will find specific directions for raising annual and biennial plants and their subsequent cultivation, and directions for the cultivation of aquatics and hardy perennials. By far the largest part of the work, however, is devoted to an alphabetical list of the best hardy annuals and perennials, with illustrations of many of the most important species. An excellent and most useful addition to this edition is found in the second part in a calendar showing, first, the time when seeds of different plants should be sown, and when they should be transplanted into the garden, and their time of flowering arranged month by month.

Les Fleurs de Pleine Terre is not a mere compilation, like so many books of its class. In it are recorded the careful experiments and observations of a remarkable family of scientific men who for three generations have labored to elevate horticulture, and more, perhaps, than the members of any other family, have raised it to its present position among the arts.

Part nine of the first volume of the *Contributions of the United States National Herbarium* is devoted to a report made by Mr. J. N. Rose on a collection of plants gathered in the Mexican states of Sonora and Colima, by Dr. Edward Palmer in the years 1890-91. Dr. Palmer's collections in these years contained no less than eighty-two undescribed species, among them a *Capparis* from the mountains near Manzanillo, a compact shrub eight feet high; a new *Cratæra*, a tree forty feet high, with a trunk fourteen inches in diameter; an arborescent *Morisonia*; a new arborescent *Forchhameria*, a photograph of which serves as the frontispiece to this report; an arborescent *Zylosma*, a tree thirty feet high; a new *Zizyphus*, which Mr. Rose proposes to call *Zizyphus Mexicana*. The fruits of this tree are gathered by the Mexicans and sold in the markets, being used as a substitute for soap and specially valued for washing woolens. *Veatchia discolor*, first collected in Lower California and described by Bentham in the *Botany of the Voyage of the Sulphur*, was found by Dr. Palmer at Angeles Bay, where it is called Torate Blanco. The bark is shipped to Europe and is said to have valuable dyeing and tanning properties.

The collection contains two new species of *Coccolobis*, one of which, curiously enough, was found on the mountain sides near Manzanillo, the species of this genus being usually littoral plants growing very frequently with their roots in brackish water.

A Palm, doubtfully referred to *Cocos*, found on the shores across the bay from Manzanillo, is described as a tree one hundred feet high, with large and pinnate leaves. The nuts are used in making soap.

These recent collections of Dr. Palmer's only serve to emphasize the richness of the Mexican flora, which seems practically inexhaustible in undescribed species and still offers a most inviting field for the searchers of botanical novelties. Mr. Rose's report, which is illustrated with a number of plates of his new species, is one of the most important of recent contributions to descriptive botany made in the United States.

Notes.

Monsieur Edward André, the distinguished landscape-gardener, editor of the *Revue Horticole* and Chevalier of the Order of the Crown of Italy, has recently been promoted to the grade of officer in that Order in recognition of his services in improving and enlarging the public gardens of Rome.

For covering the walls of a lean-to greenhouse there are few things prettier than the blue and white Plumbagos, *P. capensis* and *P. capensis alba*. They look best when trained on wires strung about three or four inches from the wall, and if in fairly rich soil and otherwise encouraged to grow, they will soon make a most brilliant display of bloom.

Daffodils and early-flowering Tulips have just passed their best, and every one who has a garden should now determine to have an abundant supply of them another year. A dozen varieties of Narcissi will give examples of all the leading types, and they are now so cheap that for a few dollars one can have enough to cut an armful any morning and hardly miss them from the general outdoor display.

The Missouri Currant, *Ribes aureum*, which is found in all old gardens, has a rather straggling habit, but it is among the earliest shrubs to show its flowers, and these are of a singularly clear yellow color. The great value of this plant, however, lies in the delicious fragrance of its flowers. No other shrub at this season has an odor at once so pleasing and so penetrating, and it is well worth planting for this quality alone.

The proceedings of the American Carnation Society at its fourth annual meeting have been published in a neat pamphlet of eighty pages, which contains not only the papers and discussions, the essential parts of which we published at the time, but it includes the valuable report of the nomenclature committee, which gives the names of all the leading varieties of Carnations, new and old, together with such information as to the quality of each as could be gleaned from the replies to a thousand circulars of inquiry sent out to the leading growers of the country by the committee.

So far the spring auction sales of plants in this city have been very brisk, and an unusual variety of plants have been offered. Indeed, all the ordinary staple herbaceous plants can be had for glass houses or open ground with shrubs and climbers, both tender and hardy, and trees for orchards and for ornamental planting. A comparatively novel feature is the offering of small lots of plants packed in baskets, so that they can be carried away by hand. This enables persons who only want a few plants to buy directly, so that practically a retail trade is carried on at auction.

The taste for the cultivation of Orchids is shown by the works devoted to these plants, which are constantly appearing. The last to reach us is entitled *Les Orchidées Exotiques et leur Culture en Europe*, a book of a thousand pages and nearly one hundred and fifty illustrations, by Lucien Linden, assisted by A. Coaniaux and G. Grignan. Botanical classification, the physiology of Orchids, their natural habitat, their cultivation under glass, importations and hybridization, are some of the subjects treated in this voluminous and comprehensive work. Some idea of the importance of Orchids as garden-plants can be obtained from the chapter devoted to their bibliography, which, without probably aiming to be exhaustive, occupies seven closely printed pages.

The Rhododendrons and other broad-leaved evergreens in the parks of this city and Brooklyn suffered very seriously from the trying winter. More than four hundred Rhododendrons were killed outright in Prospect Park, and in Central Park the destruction was almost as great, but the great mass of these plants in the extreme northern end of the park on a cold rocky slope facing the north came through without any injury whatever. The beauty and healthfulness of this group is a good illustration of the fact that these plants are not so much injured by cold as they are by the sun. Among the coniferous evergreens the Retinisporas were most badly damaged.

Two or three unusually warm days have had the effect of hurrying forward the flowers of the Sugar Maple, and for a few days past these trees have been the most conspicuous and beautiful objects in the landscape near this city. Whether standing alone or in a wood where the other trees show few signs of flowers or foliage, each separate tree looks like a soft cloud of lightest yellow, which is fairly luminous in full sunshine. In years when the weather is comparatively cool at

flowering-time these trees do not make such a striking display, because, when the flowers appear more slowly, they are accompanied by the leaves of the tree, and, although they are always beautiful, the effect is heavier, or, at least, it is not so airy as when the flowers appear alone.

More apples were exported in the season just ended than in any previous year, not excepting the banner season of 1891-92, when 1,450,336 barrels left this country for European ports. Nearly two million, or about 1,946,139, barrels of apples were forwarded to Europe from Canada and the United States this season. Prices abroad have been satisfactory to the shippers throughout the entire season, which began earlier than usual, owing to the failure of European apple crops. Golden Russets of good quality recently brought \$4.25 to \$4.75 at the wholesale auction sales in Liverpool for a barrel holding 140 pounds, and California Newtown Pippins, \$3.00 a box of forty pounds, net weight. There are but few apples in the wholesale markets in this city, the entire receipts for last week being quoted as 3,719 barrels. Since September 502,879 barrels have been sold here, against 225,221 barrels during the same term a year ago. The few Baldwins now offered command \$3.75 to \$4.50 a barrel; Northern Spies, which are even more scarce, \$3.00 to \$5.00, and Ben Davis \$4.50 to \$5.00. A few barrels of Newtown Pippins are coming from the Hudson River district, and Golden and Roxbury Russets, the latter costing as much as \$4.25 a barrel, make up the bulk of the stock on hand.

The literature of spraying has received another addition in a bulletin prepared by Mr. E. G. Lodeman, of the Cornell Experiment Station, which gives a report of experiments with apples, quinces and plums, but, after all that has been said, very little that is absolutely new can be expected. It seems to be established that the arsenites and the copper compounds will often save crops of fruit from insects and fungi when they are properly applied. The fact is also emphasized in this bulletin that spraying sometimes does little good, which means that orchards suffer from other causes than disease and insect pests. Spraying will not bring a crop of fruit when there is no food for the trees or when it is not in a form that is available. This means that fruit-growers should be as persistent in applying fertilizers and cultivating the soil as they are in the use of remedies against insects and fungi. Some of the results set forth in Mr. Lodeman's bulletin are that power sprayers are unsatisfactory with large trees because they do not throw the liquid far enough or enough of it, and, therefore, hand pumps must be relied upon in orchards, while power sprayers can be used to advantage in vineyards and among low-growing plants. Three gallons of Bordeaux mixture are needed to a tree twenty-five years old. To be effective against the codling moth Paris green must be applied immediately after the blossoms fall. Leaf-spot and cracking of the quince, the apple-scab, the shot-hole fungus of plums and cherries, and the fruit rot of plums and peaches, can all be held in check by the proper use of the Bordeaux mixture.

The Black Tartarian cherries now coming from California are larger and of a deeper color than those seen here a week ago, but they are not yet perfectly colored nor of full size. They come in box lots, without ice, and bear the journey of three thousand miles and the changes of weather on the road very well. It is expected that cherries will arrive by the car-load in refrigerator cars by the end of this week. As many as one hundred car-loads of California oranges, mostly seedlings, will reach eastern markets during this week. California grape-fruits of large size are offered at \$6.00 a box by wholesale dealers, but find slow sale, since they are light and comparatively juiceless. The smaller and thinner-skinned Jamaica pome-llos of really excellent quality bring \$7.50 a box. The Jamaica orange season is now ended, though a limited quantity of new fruit known as the spring cutting will come from that island a little later on. The last Havana oranges have arrived, and the stock of this fruit still on hand is bringing \$3.50 a barrel. More than 16,000 barrels of pineapples were landed here during last week, and on Monday alone some 14,000 barrels of this fruit were unloaded on the docks. The season for Cuba pineapples is now at its height, and in a fortnight they will come from the Bahamas and Key West. The Florida supply will be hardly a third as large as last year, nearly all the plants in the central part of the state having been frozen. Prices at wholesale range from \$4.00 to \$16.00 a hundred. A few boxes of wild oranges from Jamaica, known in the trade as Bitter Fruit, are seen in the wholesale stores. These are used solely for marmalade, and sell to canners at \$2.00 a box. Catawba grapes, held over winter in cold storage, are still occasionally seen, a box containing two and a half pounds costing thirty-five cents.

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLE:—American Forest-trees in Spring.....	191
Parks, Parkways and Pleasure-grounds.—I.....	Frederick Law Olmsted. 192
Botanical Notes from Texas.—XXV.....	E. N. Plank. 193
The Saguenay Region.—II.....	Rev. E. J. Hill. 193
NEW OR LITTLE-KNOWN PLANTS:— <i>Miltonia vexillaria</i> , "Fairy Queen" (With figure).	William Robinson. 194
PLANT NOTES.....	194
CULTURAL DEPARTMENT:—Chrysanthemums for Specimen Plants. <i>T. D. Hatfield</i>	195
Flower Garden Notes.....	W. N. Craig. 197
Early-flowering Hardy Perennials.....	R. Cameron. 197
Begonias for Bedding Purpose.....	G. W. Oliver. 198
Bedding Out.....	William Scott. 198
<i>Nymphaea Laydekeri rosea</i>	G. W. Oliver. 198
CORRESPONDENCE:—Notes from a West Virginia Garden.....	<i>Danks Dandridge</i> . 198
The Exhibition of the National Sculpture Society.	<i>M. G. Van Rensselaer</i> . 199
NOTES	200
ILLUSTRATION:— <i>Miltonia vexillaria</i> , "Fairy Queen," in Langwater Gardens, North Easton, Massachusetts, Fig. 30.....	195

American Forest-trees in Spring.

THIS is the season when we especially realize how inadequate ordinary botanical descriptions are to give any distinct idea of the appearance of our forest-trees. Even when good figures of the flowers and the leaves are presented, and when we have access to dried specimens, there is nothing to indicate the wonderful transformation which takes place every day in early spring as soon as growth begins. Even in coniferous evergreens with the first genial weather the leaves warm into a deeper color, the surfaces become more smooth and reflect more light, the bud-scales take on tints of pink and brown, and the new shoots have a gray and silvery appearance which entirely changes the general aspect of the tree. But the variation in color and form manifested by our deciduous trees is much greater. The autumn colors of our woods have long been celebrated, but as a matter of fact our forest-trees in May take on a wider range of color than they do in autumn, tints which are not so striking and gorgeous, but which are more delicate and refined.

The display of soft color begins even before the buds have noticeably swollen. The bark of the Birch-twigs turns to a richer brown, the Willow glows with a clearer yellow, and as the spray of each tree swells with the rising sap, its peculiar tint is intensified, so that long before a leaf is seen the trees are enveloped with a delicately tinted and elusive mist, which cannot be described in words, but which is the visible prophecy of approaching spring to every observing eye. Indeed, this spring halo hovers over every forest and thicket as one of the most mysterious and beautiful spectacles of all the year, although it is evanescent and almost spiritual in quality. But when the buds begin to open and release the unfolding leaves the entire aspect of the woods changes every day, and as these transformations follow each other all through the month of May, our northern forests display a matchless variety of form and of harmonious color.

The scarlet flowers and fruits of the Red Maple, the snowy blossoms of the Amelanchiers, the pink of the Red Buds, and a little later on the blossoms of Dogwood, Plums and Wild Apples, are what we first think of as the conspicuous features of our spring forests. But, while these occasional masses of flowers help to emphasize the beauty

of the woods, it is the variety and richness of the foliage which furnish their highest charm. Besides the rich tints of the young leaves, the scales of the leaf-buds in many trees assume bright colors, and in some cases, as in that of the Hickories, they grow to the size of full-grown leaves before they fall. The leaf-buds of the Amelanchier, for instance, though not as striking as the flowers, are quite as beautiful. The bright bud-scales of the Beech, whose rich color is intensified by the contrast of the delicate green of its young leaves, are as handsome as any flower could be. The long yellow-green catkins of the Birches, the bright red of the young growth of the Stag-horn Sumachs, the airy grace of the first foliage of the Hornbeams, not to speak of the tints of the Sassafras, the Wild Cherry and many other trees, make combinations which can hardly be appreciated by those who live in countries where the forests are made up of half a dozen species. And when, in addition to this richness and variety of color, we recall the fact that this panorama changes entirely every day and that each tree takes on a new aspect as its leaves thicken and its colors vary, we then realize how rich and multifrom is the beauty of our forests in the early year.

This marvel of variety is better appreciated if we examine one particular class of trees. The Oaks, for example, are especially interesting because they form so large a portion of our forests, and they show such a wide range in color and in habit at this season. About a year ago we published an article by Mr. E. J. Hill, which gave, in some detail, an account of the expression of a dozen species of Oaks which are indigenous to the vicinity of Chicago, and this record of a careful observer is of uncommon interest, as it sets forth the fact that almost every tree has a marked individuality. This is not only because the young leaves have different colors, those of the Black Oak, for example, being red, and some of them nearly scarlet, while the young leaves of the Scarlet Oak are at first quite purple, changing to light green, and those of the White Oak stained with purple and pink. The leaves vary quite as much in texture; some of them are whitened with a dense, though pale, tomentum; others are smooth or only slightly hairy, while others still are quite smooth and glossy. In some species the young leaves are so deeply cut as to give them a feathery look; in others the leaves are crowded at the ends of the branchlets in tufts; in some the petioles are long and flexible, so that the pendent leaves are easily stirred in the wind; in others they are shorter and more sturdy, so that the leaves stand out stiffly from the ends of the branches. In the different species the twigs are stained with different colors and covered with more or less down, which ranges in tint from dark russet to light gray; in some these twigs are short and stubby, and in others they quickly grow out long and slender, which gives an entirely different aspect to the tree as it is stirred by the wind. In every case the shape, and color, and attitude, and texture of the leaf are quite distinct, so that each tree has its own special appearance in sunshine and in shade, enabling any one who is familiar with them to distinguish the species quite readily at a distance in the season when they are putting forth their leaves.

The purpose of this article, however, is not to attempt an elaborate description of the appearance of any one of our forest-trees or any class of them, but rather to direct attention to one phase of the beauty of our American landscape which has been comparatively neglected. Every autumn the railroad and steamship companies of this city advertise excursions up the Hudson and to various points in neighboring states, in order to give an opportunity for seeing the glowing colors of our forests at that season. But one who spends half a day in early May in Central Park or in Prospect Park will see a picture equally rich in color and of even more varied interest. At every season our forests present spectacles of great diversity owing to the large number of tree species which they contain, but since every one of these trees changes its appearance every day as the leaves

unfold, there is an endless number of combinations for those who are on the alert to watch them. At this season, too, the air is full of an opaline haze which softens every color and smooths every rugged line, so that the prospect from any eminence which commands a forest-view is one to be studied and remembered. One who fails to note these daily transformations in our individual trees and in our woodlands loses every year one of the most characteristic and impressive phases of American landscape beauty.

Parks, Parkways and Pleasure-grounds.—I.

THIS is the title of an instructive paper in the May number of the *Engineering Magazine*, by Mr. Frederick Law Olmsted, who has had a more varied experience in designing municipal pleasure-grounds than any man in America, and, perhaps, than any man in the world. Of course, different kinds of recreation call for different types of public pleasure-grounds, and Mr. Olmsted names the plaza or formal tree-shaded promenade as the simplest. Such works are practically out-of-door halls, where the people may meet in a social way, and their use is better understood in southern Europe and Spanish America than in our country. More necessary still are open-air nurseries or playgrounds, which ought to be provided in every crowded neighborhood, where mothers and small children may find opportunity to rest and sleep and play in the open air. Playgrounds for youth or open-air gymnasias can be more remote from the crowded wards of the city. Then there are luxuries, like flower gardens, which the city ought to provide, but not until after the more essential kinds of public grounds have been secured. Of course, all these promenades, concert-grounds, nurseries, playgrounds and gardens can be combined in one way or another, and they need take a comparatively small space of the city area. But, besides these is the park proper, which is intended to provide rural scenery as a source of refreshment for townspeople. The wealthy seek change of scene in travel, but those who cannot afford this ought to have available natural scenery, and to furnish this a considerable area of land is needed. In our large cities it requires too much time to get into the country, and entrance to the fields is forbidden when it is reached, and, therefore, it becomes necessary for every large city to secure for the use and enjoyment of its people such neighboring fields and woods, pond-sides and river-banks, valleys and hills as may be made to present fine scenery of one kind or another.

On the subject of governing parks of this kind, Mr. Olmsted says :

The providing and managing of reservations of scenery is the highest function and most difficult task of the commissioners or directors of park works. Public squares, gardens, playgrounds and promenades may be well or badly constructed, but no questions are likely to arise in connection therewith which are beyond the comprehension of the ordinary man of affairs. If scenic parks, on the other hand, are to be well placed, well bounded, well arranged, and, above all, well preserved, the directors of the work need to be more than ordinary men. Real-estate dealers must, necessarily, be excluded from the management; politicians, also, if the work is to run smoothly. The work is not purely executive, like the work of directing sewer construction or street cleaning, which may best be done by single responsible chiefs. The direction of park works may probably best rest with a small body of cultivated men, public-spirited enough to serve without pay, who should regard themselves and be regarded as a board of trustees, and who, as such, should make it their first duty to hand down unharmed from one generation to the next the treasure of scenery which the city has placed in their care. Public libraries and public art museums are created and managed by boards of trustees. For similar reasons public parks should be similarly governed.

A landscape park requires, more than most works of men, continuity of management. Its perfecting is a slow process. Its directors must thoroughly apprehend the fact that the beauty of its landscape is all that justifies the existence of a large public open space in the midst, or even on the immediate borders, of

a town; and they must see to it that each newly-appointed member of the governing body shall be grounded in this truth. Holding to the supreme value of fine scenery, they will take pains to subordinate every necessary construction, and to perfect the essence of the park, which is its landscape, before elaborating details or accessories, such as sculptured gates or gilded fountains, however appropriately or beautifully they may be designed. As trustees of park scenery they will be especially watchful to prevent injury thereto from the intrusion of incongruous or obtrusive structures, statues, gardens (whether floral, botanic or zoölogic), speedways or any other instruments of special modes of recreation, however desirable such may be in their proper place. If men can be found to thus serve cities as trustees of scenic or rural parks they will assuredly be entirely competent to serve at the same time as providers and guardians of those smaller and more numerous urban spaces in which every means of recreation, excepting scenery, may best be provided.

In selecting park sites and boundaries the first problem usually is to choose from the lands sufficiently vacant or cheap to be considered, (1) those reasonably accessible and moderately large tracts which are capable of presenting agreeable secluded scenery, and (2) those easily accessible or intervening small tracts which may most cheaply be adapted to serve as local playgrounds or the like. A visit and report from a professional park designer will prove valuable, even at this earliest stage of operations. Grounds of the local playground class may safely be selected in accordance with considerations of cheapness and a reasonably equitable distribution, but the wise selection of even small landscape-parks requires much careful study. It is desirable that a city's parks of this class should present scenery of differing types. It is desirable that the boundaries of each should be so placed as to include all essential elements of the local scenery and to produce the utmost possible seclusion and sense of indefinite extent, as well as to make it possible to build boundary roads or streets upon good lines and fair grades. Public grounds of every class are best bounded by streets; otherwise, there is no means of insuring the desirable fronting of buildings toward the public domain. In spite of a common popular prejudice to the contrary, it will generally be found that concave, rather than convex, portions of the earth's surface are to be preferred for park sites. If the course of brooks, streams or rivers can be included in parks, or in strips of public land connecting park with park, or park with town, several advantages will be secured at one stroke. The natural surface-drainage channels will be retained under public control where they belong; they will be surely defended from pollution; their banks will offer agreeable public promenades; while the adjacent boundary roads, one on either hand, will furnish the contiguous building land with an attractive frontage. Where such stream-including strips are broad enough to permit the opening of a distinctively pleasure drive entirely separate from the boundary roads, the ground should be classed as a park. Where the boundary roads are the only roads, the whole strip is properly called a parkway; and this name is retained even when the space between the boundary roads is reduced to lowest terms and becomes nothing more than a shaded green ribbon, devoted, perhaps, to the separate use of the otherwise dangerous electric cars. In other words, parkways, like parks, may be absolutely formal or strikingly picturesque, according to circumstances. Both will generally be formal when they occupy confined urban spaces bounded by dominating buildings. Both will generally become picturesque as soon as, or wherever, opportunity offers.

After adequate squares and playgrounds, two or three local landscape parks, and the most necessary connecting parkways shall have been provided, it may next be advisable to secure one or more large parks, or even one or more reservations of remoter and wilder lands. In a city of five hundred thousand inhabitants a park of five hundred acres, however judiciously located, is soon so much frequented as necessarily to lose much of its rurality; in other words, much of its special power to refresh and charm. The necessarily broad roads, the numerous footways, the swarms of carriages and people, all call to mind the town, and in a measure offset the good effect of the park scenery. It is then that it becomes advisable to go still further afield, in order to acquire and hold in reserve additional domains of scenery, such as Boston has lately acquired in the Blue Hills and the Middlesex Fells. In selecting such domains, however, no new principles come into play. As in selecting sites for parks, so here it is always to be borne in mind that provision and preservation of scenery is the purpose held in view, and that demarcation of acquired lands is to be determined accordingly.

Botanical Notes from Texas.—XXV.

WAYSIDE FLOWERS.—The spreading *Senebiera didyma* is certainly entitled to this name. In the cities of the state, and as far north as Little Rock, Arkansas, it is very common everywhere, underfoot along the streets and often attempting to climb the exposed brick walls of buildings. The species may readily be detected by its variously cut leaves, the strong and almost fetid volatile oil which it exhales, and by the twin pods which justify its individual name.

The East Indian Strawberry, *Fragaria Indica*, now commonly introduced into the more eastern Gulf states, is often to be seen in the streets of Texas cities. It has a large foliaceous calyx, yellow flowers, and bears insipid dark red fruit. In riding through southern Arkansas, I heard at a railway station enterprising boys shouting "fine ripe strawberries"; they were selling this species for the genuine article. After the boys had received their ten cents a box for the berries and the train had moved on, the profanity of the travelers who tested the fruit did the sellers no harm. All the Texas species of *Tissa* delight to be literally in the way and where they are most liable to be trodden upon. We have several other small Pinks which delight in human society, and they are more common in cities than in the country. *Mollugo verticillata*, Carpet-weed, is far more abundant along railways and wagon-roads and in streets than elsewhere. Its more rare relative, *M. Cerviana*, is sure to develop the same living ways.

Monolepis chenopodioides is another plant which, though called a desert plant, is common by the wayside in many of the cities of Texas, from Galveston northward and westward. It belongs to the Chenopods, most of which are denizens of towns and cultivated fields, as much as is the species once thought to be peculiar in that respect, and so named *Chenopodium urbicum*. *C. ambrosioides*, Mexican Tea, and its variety, *Anthelminticum*, Wormseed, are seldom to be seen outside of towns and cities. The so far as known exclusively Texan *Galactia*, *G. heterophylla*, wherever I have seen it, takes readily to town life, or clings with tenacity to its old ways of living in spite of town building. Hundreds of plants of this species grow in Llano in the streets, close to the wagon tracks, and often on the ridges between the tracks.

The misnamed California "Clovers," Medics, humble yellow-flowered relatives of Alfalfa, are oftener found in cities and along railways than elsewhere. The species with purple-spotted leaves is rarer than that with unmarked and smaller leaflets. Both species may, in fruit, be easily distinguished from true Clovers by their tightly coiled bristly pods. The Geranium-like *Erodium cicutarium*, *Alfilaria*, Pin Clover, another misnomer, is cultivated sometimes for forage. I have only seen it between the ties on railways. *E. macrophyllum* grows at Austin in the state-house grounds. *E. Texanum* is common south-westward, especially around San Marcos.

Some Grasses have assumed the same ways of living as their supposed higher and more aristocratic plant neighbors. Common Buffalo Grass is not so near extinction as some of its botanical friends have intimated. The paucity of the seed-bearing form may largely tend to keep the species from literal dissemination, but the stoloniferous way of growing that both forms possess will keep it common. It is creeping along railways everywhere within its extended range, from Galveston Island to Manitoba, and from eastern Kansas to the mountains. The species is more liable to become a sharp competitor of Bermuda Grass than to become exterminated. The handsome *Oplismenus setarius* shows the same tendency as Buffalo Grass, and leaves woods for railways when an opportunity presents itself. This grass is sometimes utilized for "hanging basket" culture, for which it is well adapted. Its stems may become three to four feet long. It grows from Louisiana to San Antonio Springs, and nearly across eastern Texas from the Gulf to the Red River, so it is easily attainable.

The philosophy of the ways of living that town and wayside plants have adopted may rest in the fact that most of these are creeping or, at least, prostrate plants. Pressing them in close contact with the ground would enable them to root more readily, and so to grow and spread more rapidly. The so-called introduced useful plants are more common in cities, as they usually have their seeds first scattered there. Botanists soon learn that towns, cemeteries, and especially railways, afford excellent fields for the study and collection of plants. The broken ground there, the seeds scattered by human beings or live stock as they ride along, and the usually fenced condition of railways, allow plants to remain there in security, while they are destroyed in the pastures. There also introduced plants find lodgment and protection.

Corsicana, Tex.

E. N. Plank.

The Saguenay Region.—II.

AUGUST is the month for the ripening of blueberries in this latitude. They grow in the greatest profusion on the rocky ridges and in the Pine-lands. Two kinds were noticed, the Dwarf Blueberry, *Vaccinium Pennsylvanicum*, and the Canada Blueberry. Both mature here at essentially the same time, though the two differ in this respect by several weeks farther south. In the vicinity of Caicago the Dwarf Blueberry is the earliest of all, ripening the last of June, and the Canada Blueberry comes on three or four weeks afterward. This difference in time lessens as we go northward. The berries were large and of the best quality. They hang upon the bushes till all are ripe, and remain plump and fresh until the early frost overtakes them. The two kinds were frequently so intermingled as to make it difficult to decide whether there was any choice of soil or habitat by either species, as is generally the case in other localities where I have seen them, the Dwarf Blueberry taking to dry and rocky land, and the Canada Blueberry to damper conditions. The blueberry season makes a kind of harvest-time for the farmers and villagers, who go out to gather them, the entire household often taking part in the work. Few but French Canadians live here permanently, and they are mostly poor or with small holdings. The sale of the Bluels, as they call the berries, supplements their scanty incomes, although they dispose of them at one cent a quart. A lady who had been at St. Alphonse for some seasons said that it was looked upon as unprecedented when thirty cents were obtained for twenty-five quarts. The great abundance of the berries and comparative absence of green fruit enable the pickers to gather them with rapidity, and a skillful hand will take from one to two bushels a day. They are partly sold to canning establishments, run by persons who come in for the season, and are partly sent away in boxes. As they chiefly grow on land useless for tillage, and the supply is so great that a large percentage of the berries must annually go to waste, they provide a source of revenue for an indefinite time to come.

Another plant of the Heath family furnishes a product for home consumption, the Cowberry, or Mountain Cranberry, *Vaccinium Vitis-Idaea*. It is used like the common cranberry. Before I had found them in the fields some were handed me by a farmer in whose house I happened to be. Finding they were not the common cranberry, I inquired where they grew, and subsequently came across them on the rocks. The shining leaves and bright red berries, borne a little above the surface of the ground on short stems, were always an attractive sight. The fair round fruit suggested the propriety of one of the common names they have among the French Canadians, Pommes de Terre, Earth Apples, which seems even more appropriate than when applied to the common potato. They are also known to the people by the same name they bear among the French of the Old World, Aigrelles ponctuées, or Dotted Bilberries, since the under surface of the leaves is sprinkled with blackish points. The Cowberry was sometimes associated with another slender vine or prostrate shrub, the

Crowberry, *Empetrum nigrum*. I found this in the greatest quantities on the rocks along the St. Lawrence and the Saguenay in the vicinity of Tadousac. The blackberries contrast strongly in color with the red globes of the cowberry, and patches of the two growing together on the rocks formed charming little fruit gardens. The berries, which the Canadians call Camarines, are used in the same way as the cowberries, although they seem less serviceable and rather seedy with their eight or nine hard nutlets, though the flesh has an agreeable acid taste. Still another low plant was sometimes found in the same localities, or even mixed with these where there is a thin bed of peat-mold in the hollows of the rocks. I refer to *Comandra livida*. Its leaves resemble those of our common *C. umbellata*, but are generally larger. The fruit looks quite different, and is rather handsome. The woody roots or stems creep among the moss, sending up herbaceous stems about six inches high, which bear one or more red berries in the axils of the leaves. These are very ornamental when seen among the smooth and thickish oval leaves.

These peat mosses on the rocks, or nearly up to the summit of some of the ridges, were a frequent cause of surprise. They brought plants of very different habits into close proximity. A hollow space to catch the rainfall, or into which water ran from neighboring rocks a little higher, seemed all that was needful for Sphagnum and its characteristic plants. It was but a step from a barren, glaciated surface of rock, or one sprinkled with a few plants, to one of these beds of peat, where one would be in the midst of *Cassandra calyculata*, *Ledum* or some kindred growth. The moist air and frequent showers or fogs did not often permit the hollows to become entirely dry, and the spongy sphagnum well served its purpose of a mulch for such plants as root in the soil formed by its decay.

Ledum latifolium and *Kalmia latifolia* were not confined to such places, but were common in sandy land. Though mostly found in fruit, some were seen in flower as late as the end of August. *Cornus Canadensis* was not infrequent in flower but a few days before. Besides the Ericaceous plants that have been mentioned, the other more noticeable ones were *Epigaea repens*, *Chimaphila umbellata*, *Gaultheria procumbens*, *Pyrola elliptica* and *P. secunda*. *Mono-tropa Hypopitis* was frequent in the Hemlock woods at Tadousac. Trailing over the ground in the deep shade of evergreens was the slender *Linnaea borealis*. A familiar shrub, common about the Great Lakes in the sand, *Shepherdia Canadensis*, here grew upon the rocks. In the peat bogs and Tamarack swamps the persistent calyces and expanded style of the Pitcher-plant were still conspicuous, simulating some deep purple flower.

The rocks were often enlivened by the presence of the blue bells of *Campanula rotundifolia*, which sprang from any bit of soil where it could gain a foothold. It usually appeared under that form which gives it its specific name, with plenty of roundish leaves growing at the base of stems. Though the taller form with linear leaves, the variety *Langsdorffiana*, is the one most frequently seen in the vicinity of Chicago, the typical form with the round leaves grows upon the steep sides of sand-hills in the Pine-barrens. Similar conditions of growth have brought about quite the same results, and produced the features which are more habitual to it in its rocky home, for it seems to make but little difference whether it roots in the scanty soil of some rock crevice or in rock that has been ground to fine silicious sand and piled by the wind into a dune, and fixed in place by a scanty growth of shrubs and trees. This is a feature shown by several plants which have gained a lodgment on the dunes, but are in other places known as denizens of the rocks. One of these is the Pale *Corydalis*, *C. glauca*. It needs a more generous supply of soil than the Harebell, being a plant of larger growth. It was specially frequent on the rocky inclines facing Ha-ha Bay, where its smooth glaucous stems and yellow-tipped purplish petals formed a dainty combination amid the general barrenness. The usual wild Strawberry of the region

was *Fragaria vesca*, well marked by long conical berries, shaped like a sugar-loaf, and by its superficial akenes. Here, as well as in other places where I have met with it, the plant seems most at home in its typical form among the rocks, and more common in the northern latitudes.

Chicago, Ill.

E. J. Hill.

New or Little-known Plants.

Miltonia vexillaria, "Fairy Queen."

THIS chaste and beautiful variety has now been in flower for three weeks, and the photograph, which was taken a fortnight ago and is reproduced on page 195, does not do it justice. The plant is growing in a seven-inch pan, having four leading growths, carrying nine spikes and fifty-three flowers, each flower measuring more than three and a half inches in length by three inches in breadth. The lip is of the purest white, with a rich lemon crest; the sepals and petals are broad and overlapping—sepals white, and the petals white slightly and faintly tinged with pink at the base on their first opening, but gradually becoming pure white. Several forms of so-called white Miltonias have been introduced, such as *Cobbiana*, *Albescens*, *Alba*, etc., but "Fairy Queen" stands to-day unquestioned, and justly so, as the only pure form yet introduced.

This plant was secured four years ago, having at that time two bulbs and one lead. It has been grown with our other Miltonias in a temperature of sixty degrees by day and fifty-five degrees at night, but during very severe weather we allow the temperature to fall a trifle lower. We grow them at the west end of our *Odontoglossum*-house all the year round, and every *Miltonia* is just as perfect as the one shown in the illustration. After the flowering season we keep them partially at a so-called rest, not giving them so much water at the roots, but maintaining plenty of atmospheric moisture. When they commence to grow and young roots are emitted from the base of the growth they are overhauled and such plants as require repotting are attended to. The best potting material is made of equal parts of good fibrous peat or Fern root, with the fine part sifted out, and fresh sphagnum picked in small pieces, with finely sifted dry cow-manure sprinkled through the whole. The pots are filled to a little less than two-thirds of their capacity with clean, broken crocks, and these are covered with sphagnum to insure perfect drainage. In potting, care must be taken to set the plant firmly, keeping its base about an inch above the rim of the pot. The plant should be kept moist, although water should be given cautiously until the roots are moving actively in the new material and the growths are developing. When the bulbs begin to form, water must be given freely; in fact, they must never be allowed to get dry until they have developed their flowers.

The greatest enemies to *Miltonias* are yellow thrips, which must be exterminated as soon as they appear; sponging with tobacco-water and fumigating constantly will keep them down. The appearance of spider and thrips is a sure sign of too high temperature and dry atmosphere.

Langwater Gardens, North Easton, Mass.

William Robinson.

Plant Notes.

PRUNUS PENDULA.—This fine, early-flowering Cherry was in full bloom here a fortnight ago. The plant comes to us from Japan, and, although introduced many years ago, as yet it is comparatively rare in gardens. It is a tree of pendulous habit and covered, before the opening of the leaves, with pink flowers, profusely borne on the old wood and on that of the previous season's growth. The great abundance, the charming color of the flowers and the graceful habits of growth give it a very distinguished appearance among our early-blooming plants. It is perfectly hardy and succeeds in any good soil and fairly sheltered situation. The only drawback is that occasionally the

flower-buds are partially destroyed by late frosts. It is propagated by grafting, using *Prunus Mahaleb* or *P. Myrobalana* for stock. There is some confusion in names among the nurserymen in regard to this plant; sometimes it appears among shrubs, sometimes among the trees; at times it is a *Cerasus*, at others it is a *Prunus*; generally the species is given as *Rosea pendula*, but *Japonica* or *Sinensis pendula* is also used. *P. Miqueliania* is also in bloom now, and for garden use it resembles *P. pendula* in everything apparently, except the color of the flowers. They are almost white. Both these trees have been figured in *GARDEN AND FOREST*, vol. i., pp. 198, 199. An illustration of

inscrutable disease which has been called "Japanese-chick-back." It should be given a sheltered position, and the planter must wait patiently for his reward. The flowers are lively rose-pink, which is deeper on the outer portions of the petals, shading to the centre, and their effect is much heightened by the presence of stamens and pistils, which impart a lightness and airiness to the flower wholly lacking in the double form. The propagation is by grafting with *P. Myrobalana* as the stock. The plant is not, probably, in the hands of every nurseryman as yet, but it would not be difficult to work up a stock.

MAGNOLIA STELLATA.—This is the earliest of the Magnolias



Fig. 30.—*Miltonia vexillaria*, "Fairy Queen," in Langwater Gardens, North Easton, Massachusetts.—See page 194.

an old and large specimen of *P. pendula* was also published in vol. ii., p. 487.

PRUNUS TRILoba.—Another beautiful plant now in flower is the comparatively rare single form of the well-known *Prunus triloba flore plena*. This plant has been grown in the Arnold Arboretum for some time, and this year it has bloomed much more abundantly than it usually does. It is a shrub of moderate height and branching habit, resembling the double kind in foliage and growth, and requiring nearly the same general treatment. It seems, however, a trifle more tender, and perhaps a little more subject to that

to flower, and it has conspicuous merit. The flowers are white and borne in great abundance. It comes into bloom a week earlier than the Yulan Magnolias, and, with the exception of *M. Kobus*, is the hardiest of that division of the genus which flowers before the leaves expand. Although it begins to bloom when young in years and small in stature, it, nevertheless, attains good size. A plant in a garden on Jersey City Heights is more than twelve feet high and of equal diameter, and produces annually thousands of blossoms. In congenial soil the growth is good, but by no means as rapid as that of other

members of the family. Time is needed to produce a large plant, but, as nothing is lost by winter-killing, the grand result is, upon the whole, favorable when compared with that of *M. conspicua*, *M. Lennei* or *M. Soulangiana*. The plant needs a deep, rich soil, and, after it is well established, should have plenty of manure. Protect at first with a mulch of leaves in winter, and with evergreen boughs. The mulching of leaves should always be given, as it sometimes serves to retard the time of blooming, which is very desirable in our uncertain northern climate. It is a good plan to water well during the hot July and August weather—not a little sprinkling every day, but water by bucketsful once or twice a week. The propagation is by layers and by grafts, the last method producing the best plants. *M. stellata* was one of the plants sent to the Parsons' Nurseries twenty-five years ago by Dr. Hall, after whom it is sometimes called *M. Halleana*.

TULIPA SYLVESTRIS.—This is the common Wild Tulip and is sometimes called by bulb-dealers *Tulipa fragrans* and *T. Florentina odorata*. It is one of the most beautiful and graceful of all the Tulip species, and deserves a place in every garden where herbaceous plants are cherished. It is now in bloom, coming a little later than the so-called early Tulips, a week or more later than the *Duc van Tholls*. It is a native of Europe, and has been long in cultivation. The flowers are large and bright yellow; they are fragrant, this quality being sufficiently well marked to have given the plant the synonyms quoted above. The great beauty of the plant is the graceful form of the perianth and the pleasing way in which the flowers are borne on the stalks without any trace of the stiffness which so often mars garden Tulips. The segments of the perianth are long and narrow, and the flower buds upon its stem; occasionally two flowers are produced upon the same peduncle. No difficulty attends its cultivation; a deep mellow loam, well drained, and plenty of well-rotted manure are the only requirements. In fact, it grows so easily that it sometimes establishes itself in gardens as a veritable Wild Tulip, the only care required under these circumstances being not to disturb the bulbs. Omit the annual lifting and curing, and let them grow on with the Crocus and Daffodils, disturbing them only when they become crowded. The bulbs are inexpensive and easily obtainable.

TRITELEIA UNIFLORA.—The "Spring Star Flower" is still in bloom, although it begins to flower with the early hardy bulbs. In ordinary seasons it flowers in this latitude in March, and it is quite a showy plant when grown in moderately large clumps. The star-like flowers are for the most part white, with a faint marking round the segments and throat of pale lilac, or they are a delicate lilac as they open and quickly fade to white on the upper surface. The leaves are about six inches long and quite narrow. This species is a native of Buenos Ayres, and there is a large-flowered variety of it called *Conspicua*, which is even prettier than the type. To have the plants in flower as early as possible they should be given, of course, a sunny and well-drained situation. This *Triteleia* makes a fine pot plant in late winter for a cool house, if about a dozen bulbs are set in a six-inch pot in September and kept in a cold frame until about a fortnight before they are wanted to flower.

PAPAVER ALPINUM.—Among all the beautiful plants and flowers of the season there are none more dainty and attractive in leaf and flower than the Alpine Poppies. The neat little mound of finely cut glabrous foliage is alone beautiful, but when above this many flowers of dainty tissue spring in air on slender stems the picture is one great charm. The usual colors of Alpine Poppies are yellow, white and light pinks. These are also often in combinations, as, for instance, a yellow edging on a white ground. *P. nudicaule*, which is botanically almost identical with *P. Alpinum*, has leaves less finely cut, and among these may be found beautiful orange-scarlet flowers, and it seems to be most frequently grown in gardens. The cultivation of Alpine Poppies is very simple. The seed may be sown

either in seed-beds or in the borders, preferably early in the year. The young plants require some care in transplanting, but can be successfully moved at any time. Early-sown seeds will make flowering plants the same season, but will be at their best the second year. While true perennials, these plants are apt to go off from excessive flowering and dampness. Their requirements are perfectly drained places where no water will lodge at their base and a top-dressing over their roots in early spring, as the frosts sometimes are apt to lift them in the early year.

IRIS RUBRO-MARGINATA.—The flowering season of the rhizomatous Irises commences here in April with the flowering of this little Central Asia Minor Iris. *I. rubro-marginata* is allied to *I. pumila*, which is very familiar in gardens as a dwarf border-plant, usually flowering in May. The leaves of this species are falcate, two to four inches high, margined usually with red. The rhizomes are short and short-creeping. The flowers are small, of beautiful compact form, with large standards and of a peculiar vinous color, with metallic reflections. They are borne in profusion, and the plants at flowering-time are quietly, rather than strikingly, handsome.

Cultural Department.

Chrysanthemums for Specimen Plants.

CHRYSANTHEMUM-PLANTS intended for exhibition should now be well established in six or seven inch pots. If they have been judiciously stopped they will be compact, well-balanced plants. It is important we have a good foundation to begin with. Even at this stage the practiced eye can pick out those best suited for specimens. A poor plant now will make a poor specimen. We should not, however, judge by size only. As a rule, varieties inclined to be tall and rather coarse, even though they may be the largest plants now, do not make the best specimens. In the exhibition height is discounted. There are also many novelties received late in the season, which have all the qualities required to make good plants, although they may now be a stage behind. *Portia*, *Lora*, *White Louis Boehmer* and *Minerva*, novelties of last year, were among the largest and handsomest of specimens at the exhibitions. Among novelties of this year which look promising and worth a trial are *Burt Eddy*, *Nellie Elverson*, *Esther Heacock*, *Mrs. Henry Robinson*, *Miss Gladys Spaulding*, *Miss Maggie Blenkiron*, *Vice-President Calvat*, *Nemesis*, *Radiance*, *Nyanza* and *Monsieur R. Dean*.

When we look over our plants we shall find that some of the choicest ones have gone prematurely to bloom. This is unsatisfactory. These rarely make good specimens. It is as if they had to start over again. Often, however, they will break out anew, as did *Cullingfordii*, *G. W. Childs*, *Ivory* and *Louis Boehmer* one season. At this time these were essential in my collection for color-effect, and, having no choice, I had to persevere with them. Whenever I can afford it I always discard such plants, and when I know of this tendency I always fortify myself with duplicates enough for choice.

For large specimens intended for exhibition we use twelve-inch pots. These are really too large; but as the horticultural societies allow this size, it is not likely that exhibitors will run the risk of losing a premium by stint of pot-room. A specimen plant six feet in diameter, and from eight to nine feet over, is far too unwieldy, and the labor of tying out two dozen of such plants can only be comprehended by those who have tried it.

Our soil is light and moderately rich. We use about one-fifth well-decomposed manure; some of us have profited by the mistake of using more. We prefer to feed the plants later, and stimulants can be applied as needed, much depending upon the condition of the plants with regard to health. Lime in some form should be an ingredient of the soil. Bone-meal, if composted a month, at least, before being used, is probably the best fertilizer. It should not be put in freshly. Lime rubbish, or even coal-ashes, will answer quite well for present purposes. The drainage must be thorough. We pot lightly to avoid the risk of overwatering—a misfortune that befalls some of the most promising plants in their earlier stages. Two inches or more is left for water, and an additional dressing of good soil later.

After being potted, our plants are returned to frames for a week or two, and the sashes are kept on—although abundance of air is given—more as a precaution against heavy rain than anything. When nicely rooted in the new soil the plants are

gradually hardened, and finally placed out-of-doors about the end of May. In the mean time, we continue stopping the shoots. We go over them every day, watchful to take the tips out of any shoots which are making unusual headway. It is important that we keep them closely headed in. Soft shoots break much better than those which have been allowed to make from five to six inches of growth before being topped.

We always find room for two or three dozen small specimens which we grow in six-inch pots from May-struck cuttings, stopping them only once or twice, allowing from ten to twelve blooms to each. Compact-growing varieties, needing few stakes, are best suited for this purpose.

Our stock plants for specimen blooms, cut over in March, have now a good crop of cuttings which should be taken at once for exhibition blooms. For general decorative purpose nearly a month later will be early enough.

The cuttings should be inserted as quickly as possible after being taken, as if wilted to any extent they take a longer time to root, as well as suffer a constitutional loss. Abundance of water will be required for the first few days, and the plants should be shaded when the sun shines. As the rooting goes on, less and less water and shading will be needed, and at the end of three weeks all should be rooted and hardened enough to be potted off or boxed, according to the convenience of the grower.

Wellesley, Mass.

T. D. Hatfield.

Flower Garden Notes.

MOST of the ornamental-leaved and flowering plants for bedding out can be planted out from the middle to the end of the present month. In this latitude Geraniums can be set out with perfect safety by May 15th, but we prefer to wait until the 20th, so that all the plants may be sufficiently hardened off and that the planting may be done as quickly as possible. Geraniums, Ageratums, Tuberous Begonias and other moderately hardy plants are now in cold frames; the sashes are thrown off, except during cold nights. Begonias dislike direct sunshine, and we run a lath shading over them during the middle of the day. Coleus, Alternanthera, Cannas and other more delicate plants are now in a cool house and will be placed in frames about the middle of the month. From this time copious supplies of water will be needed by all plants in pots or boxes, and special care should always be taken at planting out time to have the balls of earth thoroughly wet. Neglect in this particular is the cause of many plants doing so unsatisfactorily. If a plant is thoroughly pot-bound and dry at the root in addition when set out, no ordinary waterings or rains will penetrate the ball of earth, and a small hollow space should be left around each plant to catch the water.

Among flowering plants Geraniums still hold a leading place, and will, no doubt, always do so. They become rather straggly by August, and heavy showers of rain give them a disheveled appearance. To restrict the growth somewhat, it is the custom with certain growers to plunge the plants out in the pots. This is done in the Public Gardens in Boston, and may be a good plan where a good water-supply is at hand. If plants have no special care, however, after being placed in the beds, this plan would not be successful. I have never been specially struck by the beauty of the Geranium beds in the Boston Public Gardens, and if they are a fair sample of what may be expected from pot-plunged plants, I prefer to stick to the old system. Cannas now occupy a front rank as flowering plants, and deservedly so; for large circular beds and wide borders they are unexcelled. Tuberous Begonias, where heavy or even partial shade can be obtained, are worthy of more extensive cultivation. We have tried them in full sunshine, but even when well watered and mulched they grew unsatisfactorily and burned badly. Begonias love a rich compost and abundant waterings during dry weather. Treated thus they are superior to Zonal Pelargoniums in every way, and the ease with which they are raised and can be kept over winter should commend them to all flower-lovers.

There are many plants now looking a little leggy and ungainly in the greenhouses which can be put to good uses in mixed borders. Among these are Abutilons in variety, Hibiscus, Datura suaveolens and D. cornucopia, Plumbagos and others. Begonias of the fibrous-rooted section will all do well on a partially shaded border, and a mixed assortment of these was as attractive as anything we had last summer. Those of the Rex section are good in rockeries or in any other situation which is rather heavily shaded. Crotons, Pandanus, Caladiums, Dieffenbachias, etc., cannot be exposed here before the middle of June, and the season for them is so short that very few care to go to the trouble of placing them outdoors. Aca-

lyphas, however, prove excellent bedders, and are being used in increasing numbers.

Our early sowings of Stocks and Asters are usually planted out about May 10th; of the first-named, Boston Florist, and of the latter, Queen of the Market, are the earliest. We continue to sow these at intervals of a fortnight until the middle of June for successive crops. Marguerite Carnations, Dianthus, Gaillardias, Verbenas, etc., are planted about the same time as Stocks and Asters. Zinnias, Phlox Drummondii, Cockscombs, Torenia, Salvias and others are left ten days later. A good number of these are dotted in perennial borders to brighten them up from the end of July onward, when otherwise these borders would present a decidedly unattractive appearance. Seedlings of perennials should now be planted out in nursery-rows and transferred to permanent quarters in the fall. Perennial borders will require hoeing and raking to keep them neat; few plants will yet require staking.

The past winter proved a destructive one here; Helianthus in variety were killed outright in some situations, something which has not happened for years before. This damage is due to the light protection of snow we had all winter long. On the other hand, Tritonias, Pyrethrums, double and single, and Anemone Japonica have come through unscathed, and, although usually these are considered tender, they withstood a temperature of ten degrees below zero, with no snow or other covering to protect them. Roses are now breaking nicely. We give these a mulching of good cow-manure all over the beds during this month. This keeps the roots cooler and retains moisture, very essential things in the cultivation of hardy Roses in America.

Grass verges have all been gone over with the edging-iron recently, and the verges will require clipping weekly from this time onward. Nothing so much adds to the appearance of a place as good lawns and well-kept verges, yet even in some of our leading parks the edges of the flower-beds do not seem to have had an edging-iron or pair of shears over them during the whole season; no matter how well a bed may be planted, if its verges are slovenly kept it is something of an eyesore to those who have been properly trained in their profession.

Taunton, Mass.

W. N. Craig.

Early-flowering Hardy Perennials.

THERE are few hardy herbaceous plants in early spring that give as much pleasure and produce such showy flowers as a good strong, healthy specimen of Adonis vernalis. The ground is hardly free from frost when it begins to push up its stems, and very soon the stems are crowned with large, yellow, anemone-like flowers. I have had several complaints about this plant from people who say they find it rather difficult to grow and flower successfully. It does admirably here, and the treatment given to it is very simple. It is grown in a border where it gets the full benefit of the sun all day. Care is taken, when planting, that it is not put beside any large plants that will shade it or rob it of its nourishment. Every third year the plants are taken up carefully and the border is double dug and enriched with manure. It is not beneficial to disturb the plant oftener than this. Small plants are not as satisfactory as large ones. The small plants only bloom for a short time in April; but large, strong plants bloom well into May. Hence the reason for not dividing them too much. Although this plant comes from southern Europe, it is one of our hardest of perennials. It never needs protection of any kind in our very severest winters.

The Hepaticas are among our earliest flowers, and most of them are over now. Under the shade of a Hemlock-tree, a few flowers still linger on Hepatica angulosa, the best of all of them. It is a beautiful plant, and its lovely sky-blue flowers are much larger and showier than those of H. triloba or H. acutiloba. It is quite hardy and delights in a rather shady position with deep, rich, moist soil.

Primula denticulata makes a good rock garden, and a large mass of plants are flowering well at this time. The flowers are produced in dense round heads on stems six to eight inches high; they are of a deep lilac color. The plant comes from India, but is quite hardy here. It thrives in moderately moist soil, and the flowers last longer if they are slightly shaded.

The large-leaved section of the genus Saxifraga is quite conspicuous in the herbaceous border now. In early spring, in exposed positions, the large evergreen leaves are rather unsightly after our severe winters; but the young leaves soon expand, and are almost full grown, if planted in a warm position, before the plants are in full bloom. S. cordifolia has

large heart-shaped leaves six to ten inches across. Its rose-colored flowers are produced in large panicles on stout stems nearly a foot long. *S. crassifolia* is also in bloom, and is closely allied to the above. It has large, leathery, oblong leaves. The flowers are of a reddish color, and are also produced in large panicles on thick stalks eight to ten inches high. Both of the above plants come from Siberia and are very hardy. They are desirable for the rock garden, and if they have partial shade their large bold leaves are not so much destroyed in winter. The soil they thrive best in is a light rich one, where they make large healthy leaves, which are attractive when the plants are not in bloom.

The White Rock Cress, *Arabis albida*, is at its best now. We use it in the front row of the herbaceous border, where its racemes of white fragrant flowers are seen to the best advantage.

Phlox subulata, the Moss-pink of old-fashioned gardens, is so full of bloom at this time that its leaves can hardly be seen. It is an exceptionally good plant for a dry sunny border, and seems to grow the best in the dry summer weather.

Cambridge, Mass.

R. Cameron.

Begonias for Bedding Purposes.

A PART from the tuberous-rooted Begonias there are several species and varieties which, on account of their handsome flowers and foliage are very suitable for the outdoor garden during the warm months. *B. Evansiana*, from eastern Asia, is quite hardy in Washington, having stood out in the Botanic Garden for the past thirty years. The roots, of course, die out, but the little bulbils which form around the axils of the leaves come up thickly in the spring and form nice blooming plants in a few weeks. *B. Evansiana* is valuable both for its leaves and flowers. The best of those valued for their flowers alone is the old *B. coccinea*; it stands the sun well; in fact, the more sun it gets the better it likes it. The flowers are produced in large pendulous clusters, and, as the specific name denotes, they are red; the female flowers are the showiest, lasting a long time in perfection. This species revels in very rich soil; large plants in small tubs when in flower—and you scarcely ever see them without flowers—are very desirable to place on lawns around a dwelling. The best manure is that from the poultry-yard. Mix it up with equal parts of loam and leaf-soil several weeks in advance of the time when it will be required for use, spread it out and let the sun dry it thoroughly; this makes the plants put on a strong growth, producing a wealth of bloom that is remarkable.

The hybrid called President Carnot is a stronger grower, standing the sun equally well; it makes larger trusses of flowers than *Begonia coccinea*, but not so many of them, and it is more serviceable as a winter bloomer. *B. caroliniae-folia*, a species forming a thick succulent stem, is good for its old palmate leaves. *B. Weltoniensis* and *B. Dregei* are free bloomers when planted in partial shade; they need open soil and must be kept watered. *B. Vernon* sometimes does admirably, but it is an erratic grower here. This variety comes true from seed, the seedlings blooming when only a few weeks old.

Begonia Erfordiae is by far the best of the recent introductions for bedding, and it has proved itself a first-rate acquisition during the two seasons I have tried it; there are two colors among plants of it raised from seed, a clear pink and a creamy white; the pink is the most valuable, as there are other whites superior to this. *B. Erfordiae* may be said to flower itself to death, as cuttings of the flowering wood are next to useless; they continue flowering without making side-shoots. It seeds freely, however, and should be included among the plants for spring sales by those who grow bedding-plants. *B. Wettsteinii* has *coccinea* blood in it, although it is a more fragile grower. *B. Diadema*, in a slightly shaded place, makes a nice display with its white spotted leaves, and *B. alba-picta* is good for the same purpose. Among the creeping varieties, *B. scandens* does well when grown in good soil and kept watered; the flowers of this species are snow-white, very small, but they appear in great numbers.

Botanic Garden, Washington.

G. W. Oliver.

Bedding Out.—Where much summer bedding is done the planting-out season is always a busy time, and much time is saved by having the designs and planting plans all ready beforehand. The principal points to be observed are the tasteful blending of colors and the most agreeable contrasts. The selection of plants will be largely determined by the location and size of the beds and borders. If the borders and beds, for example, have a background, or if they are situated so that the plants are intended to form a screen to break an undesirable view, the plants for the back row should be tall. The best effect would then undoubtedly be obtained by planting in lines

lowering gradually toward the front. If the borders are near the margin of a lawn where the view should not be obstructed, a better effect is obtained by having a groundwork of one kind of plants with other sorts planted through it in masses. Plants of the medium dwarf sorts may be used instead of regular carpet-bedding kinds, which are apt to look too squat in a border.

Beds must also be filled with plants corresponding to their size and position. Those at a distance in prominent positions require something large and showy, and for this purpose Cannas are most admirably adapted. A mass of the scarlet Madame Crozy, with a border of Caladium esculentum gives a good effect, while for those nearer the walks low-growing plants should be chosen. It sometimes happens that beds are placed in a shady position, in which case soft-wooded or flowering plants would be far from satisfactory, but such plants as Yuccas and Agaves should be used, the tallest plants being placed in the centre, and the others graduating to the edge, finished with a border of low-growing Echeverias.

Tarrytown, N. Y.

William Scott.

Nymphaea Laydekeri rosea.—This is one of the best of the small-flowering Water-lilies for general use either as an ornamental plant or for cut flowers. While it grows as freely as any of the other kinds, it has baffled all attempts at propagation, so far as known. The plant keeps on growing from the same crown, forming a thick succulent stem, the lower part of which is continually decaying as the top makes new growths. I have tried to increase it in various ways, but never have succeeded in even starting a lateral growth, and the worst of it is, the plant usually dies if it is disturbed too much. I have killed four plants already, and am as far from a solution of the problem as ever. Several other people have tried to propagate it, with like results. It sometimes produces seeds, but they do not come true. I am inclined to believe that the best way to raise it is to cross-fertilize the two parents every time seed is wanted, and thereby renew it in the same manner in which it was originally produced. Its parents are said to be the Chinese *Nymphaea pygmæa*, fertilized with pollen from the pink variety of *N. alba*. I am the more inclined to believe these to be its parents, because, for want of the flowers of the last-named kind, I have tried pollen of a dark form of *N. odorata* rosea on flowers of *N. pygmæa* with successful results. The flowers of this hybrid are nearly of the same color as those of *N. Laydekeri* rosea; there are more petals to the flower and the shape is more star-like.

Botanic Garden, Washington.

G. W. Oliver.

Correspondence.

Notes from a West Virginia Garden.

To the Editor of GARDEN AND FOREST:

Sir,—Among many shrubs now in bloom at Rose Brake, *Xanthoceros sorbifolia* (see GARDEN AND FOREST, vol. vi., p. 285) is the most beautiful. It is now a compact bush, five feet in height and is covered with its delicate blossoms, as large as those of the Weigelia. They are pure white, with centres of a pale greenish lemon color when they first open, and gradually deepening to a peculiar shade of deep red. The *Xanthoceros* remains in bloom a week or ten days, according to the weather, and is a very showy and striking acquisition to our list of hardy shrubs. The foliage is well developed at present only on the lower limbs. It resembles that of the Mountain Ash, as its specific name indicates, but is darker and more glossy. The habit of the shrub is graceful and compact, so that it is attractive at all seasons and should have a place of honor in the garden. I wish some one would give it a prettier name.

The wild garden and the rockery are now most interesting. Two varieties of *Senecio* are flowering, both native to our woods. These are the interesting *S. aureus* (Squaw-weed), with its beautiful purple-lined leaves and heads of showy yellow composite flowers and its taller variety, *obovatus*. *Phlox subulata* is still flowering, and *P. divaricata* is very pretty now in the woods, but, though easy to transplant, it does not flourish in the heavy clay soil of our garden. It is not an aggressive plant and is easily discouraged by the encroachments of grass or perennials of strong growth. It seems to require the rich loam, partial shade and leaf-mulching of open woodlands for its best development. It is such a charming plant that it is a pity we cannot give it the conditions it requires. It seems to me the most refined and pleasing of all the Phloxes. (*P. divaricata* was figured in GARDEN AND FOREST, vol. vii., p. 256.—ED.)

Veronica Buxbaumi is a bright-eyed, cheerful little plant,

which has wandered here from Europe and is desirable for the rockery because of its hardness, its very early and profuse bloom, and the extraordinary duration of its time of flowering. How it came here is a mystery, but it suddenly appeared one spring in a neglected border and has held its own ever since. It begins to bloom in March and thrives on scanty soil. *Saponaria ocymoides* is a showy little trailer, also from Europe, just beginning to open its small pink flowers. It is useful and pretty when planted in a crevice of the rocks, which it curtains with its delicate bloom. It is one of the little plants to which we become greatly attached. Its near neighbor, *S. Japonica*, does not bloom until July.

Mertensia Virginica is now beginning to fade. This is an admirable plant for massing. One can hardly have too much of it in the wild garden, where its sheets of sky-blue are very effective at a time when so few herbaceous perennials are yet in bloom. We have planted large clumps of it at the foot of the rocks, and here the wild Columbine nods to it from the cracks and crannies above, contrasting its red and yellow blossoms with the dainty azure of the *Mertensia*, and forming a beautiful picture such as may often be seen in our native woods.

To-day, May the seventh, I plucked the first Rose from a bush of *Rosa cinnamomea*, the Rose Tangle, among the rocks.

Danske Dandridge.

Shepherdstown, W. Va.

The Exhibition of the National Sculpture Society.

To the Editor of GARDEN AND FOREST:

Sir,—The exhibition of works of sculpture in connection with gardening art, now open in the Fine Arts Building, on Fifty-seventh Street, is much more genuinely successful than could have been expected. For one thing, less has been attempted than we were led to believe would be the case by the anticipatory circular issued some weeks ago and then commented upon in the editorial columns of GARDEN AND FOREST. No effort has been made to show, or even to suggest, schemes of landscape-gardening, or even of naturalistic gardening on a small scale; and, of course, these were the schemes least well adapted for treatment in a restricted and covered space, with such plants as could be supplied in pots, and without the possibility of using expanses of grass. And, in the second place, in treating the formal gardening ideas which alone have been attempted, architectural elements of a more important and effective sort have been achieved than one might have thought would be attempted for so transitory a purpose.

As deputies of the National Sculpture Society, the first care of the projectors was for their own art. They wanted to show, not the possibilities and the attractions of formal gardening as such, but the essential service it can render as a setting for works of sculpture and the architectural elements which are their natural, and often their indispensable, accompaniments. They wanted to convince the public that all kinds of statuary suitable for outdoor use might be more artistically and effectively used than any of them are to-day in this country, and especially that, with proper surroundings, works of an ideal character come into this category to a much greater degree than we now realize.

From this point of view, the fact that they had to make their exhibition indoors was not as great a drawback as may be thought. A circular which they have recently issued says that this exhibition ought to suggest to the public "the possibility of creating a purely American conservatory garden which will be a real home for sculpture a garden which could be kept covered with glass during five months of winter by means of sections of glass frames, thus forming a conservatory, and which would be uncovered during the other months of the year, thus forming an open-air garden. Hitherto it has been argued that the severity of our climate made the placing in gardens and parks of marble statues a useless waste of money; but this argument will no longer hold good." And, indeed, the present exhibition shows what a delightful place might be created in this manner, while it suggests possibilities of more extensive treatment on a larger scale out-of-doors, when works in bronze, capable of resisting the effects of our winter weather, might be employed, or roofed alcoves and colonnades might protect more perishable materials.

In the first gallery, which runs all across the breadth of the Fine Arts Building, a series of clipped hedges, well disposed in variously curving lines, cut off the corners of the rooms, and supply niches and alcoves where statues are effectively set. The steps which, opposite the entrance door, lead up from this room into the small central apartment, are now masked by a temporary balcony, with a handsome balustrade

and flights of steps leading up to it from either side; and in front of this balcony is a large flower-bed, of complex but symmetrical outline, which offers an excellent suggestion in regard to the way that the effect of the porches and piazzas of our country-houses might be improved by some semi-formal transition between them and the lawn.

Standing on the balcony and looking through the central room (where no gardenesque work has been attempted) we get a beautiful view into the big Vanderbilt Gallery, which has been utterly transformed from its usual aspect. This great square room is now divided into three unequal parts (the largest being the middle portion) by high walls, seemingly of marble, which run from the entrance nearly to the opposite wall of the room, where they are connected by a tall Ionic colonnade. The walls are some eight feet in height, with several massive piers which rise higher and are surmounted by ornamental plants (chiefly Palms) in huge pots and vases. On each side the wall retreats into a circular niche, filled by a fountain of running water, over which presides a statue of a child, appropriate in character to its place; and in front of each wall, likewise leading the eye toward the colonnade, runs a row of Tree-ferns, fifteen feet high, growing, of course, in tubs. Through the colonnade, the entablature of which is formed by a beautiful bas-relief by Mr. Herbert Adams, destined to adorn the Baptist Church on Washington Square, we see a lofty hedge of green, and against this stand three white statues, each opposite to one of the intercolumniations, and being thus effectively enframed to the eye; and these statues have been carefully selected for their simple dignity of outline—for a sort of semi-architectonic character thoroughly appropriate to the use to which they are put as complements of the architectural scheme.

All the architectural elements are constructed of white plaster, in the same way, I suppose, that the work of building the Chicago Fair was done; but they look solid and marble-like, and they are so handsome in themselves, alike in their proportions and their simple details, and so well adapted in scale to the room in which they stand, that I found that people who had not previously seen the room supposed, of course, that they were permanent features. The success achieved in this direction seems all the more remarkable when we remember that the organizers of the exhibition had possession of the galleries for less than a week before the opening day. The work was directed, I understand, and the designs made, by Mr. Thomas Hastings, of the architectural firm of Carrère & Hastings, assisted, of course, by the counsels, the taste and the practical help of many other members of the Sculpture Society.

Messrs. Pitcher & Manda have lavishly aided these gentlemen by supplying them with the plants needed for the carrying out of their scheme. Of course, its horticultural elements must not be too strictly judged for the quality of appropriateness, either as regards the special service to which some of them are put or their effect as a whole. Under such conditions, not the best possible, but only the best available, plants could be utilized, and this must be borne in mind when estimating the result. The many hedges, some of which are very tall, are not growing, but manufactured, hedges, composed of branches of the Red Cedar, *Juniperus Virginiana*. But these have been so skilfully set and supported and bound together that the deception is not apparent even when they stand in such a way that both of their sides are visible. The Tree-ferns, which form, as it were, a natural colonnade, leading the eye up to the marble one, are beautiful specimens, nearly alike in height; and many of the Palms and similar plants which fill the great pots and vases on the piers of the wall and of the balcony balustrade in the first room deserve equal praise, while the pots and vases themselves are often very beautiful. Among them one fancies that he recognizes individuals that figured upon the New York Building at the Chicago Fair, which, it will be remembered, was decorated with such plant receptacles, specially imported by Mr. McKim, from Sicily, if I am not mistaken.

The beds of hardy herbaceous plants contain interesting specimens in flower, and, although they are grouped as harmoniously as is possible under the conditions, few of them can be considered appropriate settings for the works of art they support. Some small deciduous trees, just coming into leaf, add a touch of refinement to the general effect, although they do not accord very well in character with their tropical neighbors. Some collections of Orchids, massed on shelves in the corners of the rooms behind the hedges, are even less well suited to their places, although they are well worth examination on their own account. Other specimens of Orchids have been suspended from the trunks of the trees, and Stag-horn Ferns and Pitcher-plants have been attractively

used in the adornment of the fountain-niches. The large bed which lies in front of the balcony in the first room is edged with Box, but filled with tropical plants too high for their positions. It should never be forgotten that such beds as these, however beautiful their design may look on paper, are never effective in actuality unless one can recognize the patterns they make at a glance; and this, of course, is impossible, except from an elevated position, unless they are filled with very low-growing plants.

This is not the place in which to speak in detail of the works of sculpture which were the *raison d'être* for the exhibition. I can only say that there are many very good ones among them, and that, as a whole, they will probably give the public a truer idea of the development of this art in America than it has hitherto conceived. Moreover, it is now enabled to form some judgment with regard to the kinds of work which are best fitted for outdoor display, while even our sculptors themselves ought to learn much in regard to the necessity for placing their outdoor figures with care. The beautiful effect of white stone against green backgrounds is not the only point made plain. We realize that a work of a scale too small to look well if stationed quite "in the open" may look admirably out-of-doors if it forms an adjunct to some architectural motive or is set in some verdant corner where it will not be palpably out of scale with its environment. And also that, when a statue or group is not equally beautiful on all its sides, it is as possible as desirable, out-of-doors no less than indoors, so to place it that only those sides which are most satisfactory shall be visible.

On the whole the executives of the Sculpture Society deserve high praise for the originality, the energy and the good taste they have shown in organizing and arranging this exhibition. So pretty and attractive is the general effect of these galleries just now that even persons possessed of no distinct artistic or horticultural tastes ought to find much delight in visiting them.

M. G. Van Rensselaer.

New York.

Notes.

A writer in *The Strawberry Culturist* has been testing different varieties of strawberries for fruiting under glass, and he finds that the comparatively new Brandywine yields the greatest amount of good fruit.

A grower of strawberries in Maine finds boughs or small trees of Spruce or Pine the best material for covering the plants in winter. These collect and hold the snow, which is the best non-conductor of heat, while permitting, at the same time, a sufficient circulation of air.

European orders are arriving in California for considerable quantities of redwood, to be used in the making of lead-pencils. This timber varies a good deal in the quality of its grain, but the best of it is found to be an acceptable substitute for Florida cedar, which is becoming rare.

Texas did not escape the cold weather which visited other southern states, and snow two feet deep fell along the coast in February. The season was, therefore, unusually late, and such plants as Dog-tooth Violets and Bluets, which usually flower in February, did not appear until the middle of March.

Daphne Cneorum, always an uncertain little evergreen here, seems to have come through the winter unusually well, and is now covered with its fragrant pink blossoms, and there is nothing better than this trailing shrub for rock-work. Flowering at the same time, but a good deal more hardy and trustworthy, are the half-shrubby perennial Candytufts. The flowers of these Candytufts are as white as snow, and since the plants resemble the Daphne in habit the two make admirable companions.

Mr. J. H. Hale writes to the *Florists' Exchange* that, although the Fay Currant has been introduced more than ten years, and has been propagated ever since by all the nurserymen of the country, it still commands a higher price than the older varieties of Currants. It seems strange that when this is known to be the case that the stock of the country is invariably sold out every year before the end of the season's trade. Perhaps one reason for this is that this variety does not root readily from cuttings, and that when it does root it never makes as strong a growth as the Victoria, the Cherry or the White Grape, so that from an equally-sized block of plants at least one-third more salable bushes of other varieties can be dug than of the Fay. Of all Currants the North Star is the easiest to grow and propagate, and under ordinary conditions it has grown to a height of four feet from cuttings in a single season.

Writing to the *American Agriculturist*, Mr. John N. May advises any one who can afford to buy only one Rose-plant to select Clothilde Soupert. This Rose belongs to the Polyantha class; it is perfectly hardy and blooms until frost; the flowers are a beautiful soft pink when they first open, changing to a pearly white as they get older; they are of excellent form and sweet-scented. After Clothilde Soupert, Mr. May recommends Mrs. Degraw, a Rose of the Bourbon class, glossy pink, and continuously in bloom; Souvenir de la Malmaison, another Bourbon, large, flesh-colored; La France, a Hybrid Tea, clear soft pink; General Jacqueminot, a Hybrid Perpetual, crimson; Duchess of Albany, another Hybrid Tea, a sport from La France, deep pink in color; and Dinsmore, a Hybrid Perpetual, coral-red. To these can be added Empress Augusta Victoria, white; Papa Gontier, bright red; Etoile de Lyon, yellow—Tea Roses which are not quite hardy, but which can exist through ordinary winters with good protection.

The very warm weather of the past two weeks has hurried forward large supplies of southern vegetables, the crops that were planted in Florida after the February freeze having become marketable at the same time with vegetables from North Carolina and Virginia. Asparagus, for example, on Friday of last week sold at wholesale for as little as thirty to seventy-five cents for a dozen large bunches. Hundreds of crates of beans and peas from Florida were left unclaimed on the docks by consignees, since they could not be disposed of at prices which covered the expenses for freight, and these perishable vegetables were carted away and destroyed at an additional expense to the steamship companies. French artichokes from New Orleans, much smaller than those which have been coming from Algiers, bring seventy-five cents a dozen. New Brussels sprouts from Bermuda cost twenty-five cents a quart, and celery from the same islands twenty-five cents a bunch. Strawberries are plentiful, and those from Norfolk bring as much as thirty cents a quart retail for the choicest. The Maryland crop is expected to arrive during the current week.

California oranges, both Navel and seedling, are still arriving in large quantities, ten car-loads of this fruit having been sold at auction in this city on Monday. Prices are low, and the cost of shipment is hardly covered. Bananas are bringing extreme prices, the best grade from Aspinwall, Banes and Sama realizing from \$1.75 to \$2.00 a bunch by the truck-load on the docks. About 23,000 barrels of pineapples came into this port from Cuba during last week, and schooners from the Bahama Islands are bringing large quantities in bulk. The shipments from Nassau will continue until about the middle of July, or a month later than those from Havana. Much of the Bahama fruit was canned at home last season, but the experiment seems to have been unsatisfactory. The decay in pineapples is a very considerable item in determining prices for the sound fruit. The first pineapples of the season are naturally rather green, and they carry better because they are more firm than riper fruit. The percentage of decay in the green fruit amounts generally to ten or fifteen per cent, though the average decay in the riper Havana fruit reaches thirty-five or forty per cent., and the loss sometimes amounts to as much as ninety per cent. The weather is largely responsible for decay, especially in the loose cargo lots, the moisture from rains in the green tops occasioning fermentation.

According to Dr. T. H. Hoskins, the Apple known as Scott's Winter is practically the only valuable native variety which will thrive in his climate on Lake Memphramagog and in the Clyde River valley and yield fruit that will keep all winter. This fruit is not at its best until about the first of April, and it will keep well a good month longer. All through the north-west, as well as in northern Vermont, especially in Wisconsin, Iowa and Minnesota, it is considered the best apple for the late winter market. No other variety so productive of such handsome fruit will grow north of the point where the Baldwin fails to endure the cold. A fence-corner seedling, it was introduced by Dr. Hoskins some twenty years ago and named for the owner of the farm where it originated on the west shore of Lake Memphramagog, less than a mile from the Canada line. The original tree is said to be in good condition still. Dr. Hoskins is propagating another late winter Apple-tree from Russia, which bears what he regards a better dessert fruit than Scott's Winter. A specimen of this apple sent to this office is of fair size, a beautiful color and pleasant aroma. The flesh is firm in texture and fine in grain. The flavor is hardly sprightly enough to suit an educated taste, but for the cold north, where few good kinds will grow, the hardiness of the tree and the admirable keeping qualities of the fruit ought to make it a most desirable variety.

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLE: —Popular Books about Flowers.....	201
Parks, Parkways and Pleasure-grounds.—II.....	Frederick Law Olmsted. 202
When is Rhus toxicodendron Most Active?.....	Dr. V. Havard. 203
In the Pines.....	Mrs. Mary Treat. 203
FOREIGN CORRESPONDENCE: —Primulas.....	W. Watson. 204
PLANT NOTES:	205
NEW OR LITTLE-KNOWN PLANTS: —A Blue Water-lily from Mexico. (With figure).	Professor J. W. Rose. 205
CULTURAL DEPARTMENT: —The Rock Garden.....	T. D. Hatfield. 205
About Tulips.....	J. N. Gerard. 207
Narcissus Notes.....	E. O. Orpet. 207
Coreopsis grandiflora.....	W. N. Craig. 208
Dionaea muscipula.....	William Scott. 208
Saponaria ocymoides, Fritillaria imperialis aureo-marginata.....	G. W. O. 208
CORRESPONDENCE: —Winter Storage for Tender Evergreens,	Francis Blake, E. O. O. 208
Wayside Shrubbery.....	M. 209
Rhododendrons in a Hard Winter.....	H. H. Hunnewell. 209
Shy Wood Plants.....	John Chamberlin. 210
RECENT PUBLICATIONS:	210
NOTES:	211
ILLUSTRATION: —A Blue Mexican Water-lily, Fig. 31.....	206

Popular Books about Flowers.

ONE of the noteworthy features of current popular literature is the large number of publications on the subject of our native wild flowers. Most of these books have had a large sale, and the natural inference from this would be that there is a growing interest in botanical science. It is possible, however, that the plan of doing out information in unrelated scraps and bits is not the true way to impart scientific knowledge. The teacher who does no more than fill up the minds of his pupils with fragments of truth really renders him little assistance and may inflict upon him a genuine injury. One who imagines that he is improving his mind when he is simply memorizing facts which others have discovered makes a fatal mistake. The real educational advantage derived from the study of a science is not so much the truth that is acquired as the habits of personal and self-reliant observation which are gained. Most of the books, however, to which we have alluded make no pretense of being scientific. Indeed, it is often announced as one of their conspicuous merits that they are cumbered with no science and with as little scientific language as possible. They set out with the assumption that systematic botany is a forbidding subject, and they aim, therefore, to impart information about plants in an attractive way, and this apparently means in an unsystematic and desultory way which is supposed to make moderate demands on the attention of the reader. What they propose primarily is to enable the reader to find the name of a plant by some method which will not require any effort. Sometimes the lists of flowers are arranged according to their color, or again according to their season of bloom, but they are never grouped or classified according to their structural affinities, which would seem to be the most natural way for people who have eyes and the power of association and comparison.

Two reasons are assigned for preparing treatises of this sort. One is the notion, and a silly one it is, although it has been put forward by men who ought to know better, that scientific knowledge destroys all sentiment and poetic feeling, and that the more one knows of the structure and vital processes of plants the less he is alive to their

beauty. If one should claim that an acquaintance with geological science destroys all appreciation of the grandeur of mountain scenery, and that a knowledge of astronomy renders its possessor blind to the splendors of the starry heavens, the natural reply would be that only those who realize the vast periods of geologic time during which the earth has been molded into its present form, and the illimitable space through which the heavenly bodies are wheeling, as revealed by astronomical science, can receive any adequate impression of the sublimity of the earth and skies. Just so one who studies with microscopic care the structure of a flower, with its adjustments and relationships, feels more of its true poetry than the casual observer, who notes only its exterior graces of form and color. The second reason offered is that the scientific names of plants are repulsive, and that still more so are the names applied to their different organs and the processes of their development. But, as we have explained before, the difficulty in both cases is exaggerated. The botanical names of plants, it is true, are not always what they should be, but most of them mean something, and, as a rule, they are as easy to acquire as the common names, many of which are applied to half a dozen different species, while almost every ordinary plant has, at least, as many common names. It is the universal testimony of all who have made any serious study of botanical science that these plant names are not half as formidable as they seem, and that they invariably help, rather than hinder. Of course, as soon as one examines a plant or anything else carefully, and wishes to distinguish its various parts, some name must be invented, and we must talk of petals and pistils and stamens, and all the rest, as soon as we begin to separate the plant into its component parts. As soon as we learn to distinguish things we must have names to represent them, and it is impossible to write or speak intelligently of plants without using new terms unless we adopt clumsy circumlocutions. It is not objected to the study of elementary arithmetic that a boy must learn the meaning of dividend and subtrahend; it is simply the necessity of supplying a word to represent accurately a new idea.

Now, it is not to be inferred from all this, that we object to what is called the popularization of science. The real danger from these books is that they have a tendency to vitiate the popular idea of what real science is. One who has been helped by the means of pictures and other assistance to apply the proper names to one hundred and fifty different plants has the advantage of just that amount of mental furniture. When he hears one of these names he knows what plant is referred to, and he is certainly better off than one who does not know this much, but, of course, this knowledge gives him no title to the possession of any real botanical science, and the danger is that young people who are helped to such a trivial amount of information will be prevented from an effort to acquire more, and will be deprived of enjoying the fruits of genuine personal application. It is quite as easy for young people to begin right. It is not to be expected or hoped that many of them will make any great progress in the intricacies of this science, but, as far as they go, their knowledge can be accurate and systematic, and they can have the advantage of their training powers of attention and comparison. They may get no farther than the very rudiments of the science, but, as far as they go, it will be true science, and they will have not only the mental improvement, but the sense of power as well as the pleasure which comes from orderly study and the attainment of knowledge by the exercise of their proper faculties. What the student gains by his own investigation is not only useful knowledge, but it helps him to acquire other knowledge. It is not the facts that are so much needed by the student as the development of the habit of systematic observation.

The real work of this kind must all be done by the student, although, of course, this work will be much more effective under the sympathetic guidance of a skilled instructor. Instead of waiting till he can find a flower and

carry it to the book to hunt up its picture he can begin with the first leaf he sees, and note its outlines and appendages and peculiarities of position. One of the great botanists of the age has said that when a child with the plants in his hand learns to discriminate, by his own observation, between such parts as the simple, heart-shaped, opposite stalked leaves of a Lilac, and the compound, alternate, stipulate leaves of a Rose, he is gaining the habit of acquiring knowledge which is not at all measured by the amount or the kind of information received. It is not a matter of much moment whether he learns such trivial facts as those mentioned, but it is of the highest importance that he should be taught how to obtain knowledge by such direct observation and comparison. Of course, his studies should commence with the observations of the simple external forms of plants with the more obvious roots and stems, leaves, tendrils, veins, flowers, etc., but such a beginning forms a habit which will surely carry him forward to more difficult fields.

The word science has a formidable sound to many ears, but it really means nothing but systematic knowledge. Every child during the earlier years of its life is engaged almost continually in what is practically scientific study. He is examining every phenomenon that presents itself to his senses ; he observes things, he compares them, he naturally forms some idea of their alliances and classifies them by their prominent characters. The best thing that a teacher can do is to encourage him in just this sort of work instead of giving him a book to tell him what some one else has found out. Of all the natural sciences botany is the most convenient for training the eye to see and the mind to note relations with alertness. Material for this study is at hand everywhere and at every season. These popular books are all flower-books, but the flower is only a part, and a small part, of the plant. Every tree invites investigation — its general form, the ramification of its branches, its bark, its winter buds, all open wide fields for delightful study as the student's mind improves and he becomes more able to draw conclusions from what he sees. There are lessons in every window-plant in winter, and even in the dried stalk of every wayside weed. Professor Marshall Ward, whom we have already quoted, has well said that a Hyacinth bulb, when compared with a Potato tuber, makes a most interesting object of study, and so does every nut and apple and orange which a child eats.

All this means that science can only be acquired by study, and not by reading popular flower-books. But study, so far from being drudgery, is delightful occupation. Studious habits are easily acquired by the young, and botanical science, when properly prosecuted, is one of the best ways of training the eye and the mind to habits of attention. Besides this, it is a study which brings one into close contact with nature, and stimulates a love for natural objects, which will increase with years and prove a life-long joy and solace.

Parks, Parkways and Pleasure-grounds.—II.

IN our last issue we quoted from the *Engineering Magazine* portions of an article on this subject by Mr. Frederick Law Olmsted, which discuss the government of parks and the points to be considered in choosing their sites and boundaries. The selections which follow include the greater part of what Mr. Olmsted says in relation to the plans or designs of parks and to the construction of parks :

In order to be able to devise a consistent plan, such as may be followed during a long period of years with surety that the result will be both useful and beautiful, it is necessary, in the first place, to define as accurately as possible the ends or purposes to be achieved. As already remarked, these ends or purposes are as numerous as are the various modes of recreation in the open air. Thus, a small tract of harbor-side land at the north end of Boston has been acquired by the Park Commission in order to supply the inhabitants of a poor and crowded quarter with a pleasant resting-place overlooking the

water, and with opportunities for boating and bathing. Accordingly, the plan provides a formal elevated stone terrace, connecting by a bridge spanning an intervening traffic street with a double-decked pleasure-pier, which in turn forms a breakwater enclosing a little port, the shore of which will be a bathing beach. In the adjacent city of Cambridge a rectangular, level and street-bounded open space has been ordered to be arranged to serve as a general meeting-place or promenade, a concert-ground, a boys' playground, and an outdoor nursery. Accordingly, the adopted plan suggests a centrally placed building which will serve as a shelter from showers and as a house of public convenience, in which the boys will find lockers and the babies a room of their own, from which also the head-keeper of the ground shall be able to command the whole scene. South of the house a broad, but shaded, gravel space will provide room for such crowds as may gather when the band plays on a platform attached to the veranda of the building. Beyond this concert-ground is placed the ball-field, which, because of the impossibility of maintaining good turf, will be of fine gravel, firmly compacted. Surrounding the ball-ground and the whole public domain is a broad, formal and shaded mall. At one end of the central building is found room for a shrub-surrounded playground and sand-court for babies and small children. At the other end of the house is a similarly secluded outdoor gymnasium for girls. Lastly, between the administration house and the northern mall and street, there will be found an open lawn, shut off from the malls by banks of shrubbery and surrounded by a path with seats where mothers, nurses and the public generally may find a pleasant resting-place.

Plans for those larger public domains, in which scenery is the main object of pursuit, need to be devised with similarly strict attention to the loftier purpose in view. The type of scenery to be preserved or created ought to be that which is developed naturally from the local circumstances of each case. Rocky or steep slopes suggest tangled thickets or forests. Smooth hollows of good soil hint at open or "park-like" scenery. Swamps and an abundant water-supply suggest ponds, pools or lagoons. If distant views of regions outside the park are likely to be permanently attractive, the beauty thereof may be enhanced by supplying stronger foregrounds; and, conversely, all ugly or town-like surroundings ought, if possible, to be "planted out." The paths and roads of landscape parks are to be regarded simply as instruments by which the scenery is made accessible and enjoyable. They may not be needed at first, but, when the people visiting a park become so numerous that the trampling of their feet destroys the beauty of the ground cover, it becomes necessary to confine them to the use of chosen lines and spots. These lines ought, obviously, to be determined with careful reference to the most advantageous exhibition of the available scenery. The scenery also should be developed with reference to the views thereof to be obtained from these lines. This point may be illustrated by assuming the simplest possible case, namely, that of a landscape park to be created upon a parallelogram of level prairie. To conceal the formality of the boundaries, as well as to shut out the view of surrounding buildings, an informal "border plantation" will be required. Within this irregular frame or screen the broader the unbroken meadow or field may be, the more restful and impressive will be the landscape. To obtain the broadest and finest views of this central meadow, as well as to avoid shattering its unity, roads and paths should obviously be placed near the edges of the framing woods. In the typical case a "circuit road" results. It is wholly impossible to frame rules for the planning of rural parks ; local circumstances ought to guide and govern the designer in every case ; but it may be remarked that there are few situations in which the principle of unity will not call for something, at least, of the "border plantation" and something of the "circuit road."

Within large rural parks economy sometimes demands that provision should be made for some of those modes of recreation which small spaces are capable of supplying. Special playgrounds for children, ball or tennis grounds, even formal arrangements such as are most suitable for concert grounds and decorative gardens, may each and all find place within the rural park, provided they are so devised as not to conflict with or detract from the breadth and quietness of the general landscape. If boating can be provided, a suitable boating-house will be desirable ; the same house will serve for the use of skaters in winter. In small parks economy of administration demands that one building should serve all purposes and supply accommodations for boating parties, skaters, tennis-players, ball-players and all other visitors, as well as administrative offices. In large parks separate buildings, serving as restaurants, boat-houses, bathing-houses and the like, may be

allowable. It is most important, however, to remember that these buildings, like the roads and paths, are only subsidiary, though necessary, adjuncts to the park scenery; and, consequently, that they should not be placed or designed so as to be obtrusive or conspicuous. Large public buildings, such as museums, concert halls, schools and the like, may best find place in town streets or squares. They may wisely, perhaps, be placed near, or facing upon, the park, but to place them within it is simply to defeat the highest service which the park can render the community. Large and conspicuous buildings, as well as statues and other monuments, are completely subversive of that rural quality of landscape the presentation and preservation of which is the one justifying purpose of the undertaking by a town of a large public park.

That the man who thinks out the general plan of a park ought to have daily supervision of the working out of that plan is undoubtedly theoretically true. It is impossible to represent in drawings all the nice details of good work in grading and planting, and yet no work is more dependent for its effect upon finishing touches.

On the other hand, however desirable the constant oversight of the landscape-architect may be, it is impracticable under modern conditions. The education of a designer of parks consumes so much time, strength and money that no existing American park commission, unless it be that of New York, can as yet afford to engage the whole time of a competent man. Consequently it is the usual practice for the landscape-architect to present his design in the form of a drawing or drawings, and to supplement the drawings by occasional visits for conference with those in immediate charge, by descriptive reports and by correspondence.

The prime requisite in the resident superintendent of park work is efficiency. Naturally enough, most of the superintendents of parks in the United States have been trained either as horticulturists or as engineers, but it is not necessary, or even desirable, that such should be the case. Probably the best results will be achieved by men who, possessing the organizing faculty and a realizing sense of the importance of their work, shall, with the assistance of an engineer and a plantsman, labor to execute faithfully designs which they thoroughly understand and approve.

Most men of specialized training, such as architects, engineers and all grades of horticulturists, stand in need of an awakening before they are really competent to have to do with park work. Each has to learn that his building, his bridge or road, his tree or flower, which he has been accustomed to think of as an end in itself, is, in the park, only a means auxiliary and contributive to a larger end—namely, the general landscape. It is hard for most gardeners to forego the use of plants which, however lovely or marvelous they may be as individuals, are only blots in landscape. It is hard for most engineers to conform their ideas of straightforward construction to a due regard for appearance and the preservation of the charm of scenery. Neatness of finish in slopes adjacent to roads is not sufficient; such slopes must be contrived so as to avoid formality and all likeness to railroad cuts or fills. Road lines and grades which may be practicable in the ordinary world are to be avoided in the park, because the pleasure of the visitor is the one object held in view. Roads, walls, bridges, water-supply, drainage and grading—such of these works as may be necessary are to be executed with all technical skill, as in the outer world; but the engineer in charge should be a man who will see to it that the work is done with constant regard to the object of a park as distinguished from the object of a city street or square or railroad.

Similarly, the park planter should be a man capable of holding fast to the idea that the value of a rural park consists in landscape, and not in gardening or the exhibition of specimen plants. Guided by this idea, he will avoid such absurd traces of formality as the too common practice of planting trees in rows beside curving driveways. In devising necessary plantations he will give preference to native plants, without avoiding exotics of kinds which blend easily. Thus, where a Banana would be out of place, the equally foreign Barberry, Privet or Buckthorn may be admissible and useful. Influenced by the same principle, he will confine flower-gardening to the secluded garden for which space may, perhaps, be found in some corner of the park.

Nothing, at first thought, would appear easier than to arrange a few trees in a beautiful group, yet experience has taught us that the generality of persons, in their first essays in ornamental planting, almost invariably crowd their trees into a close, regular clump, which has a most formal and unsightly appearance, as different as possible from the easy-flowing outline of a natural group.—*Downing.*

When is *Rhus toxicodendron* Most Active?

I BELIEVE it is generally assumed that the most active part of Poison Ivy is the leaves; at least, they are the only officinal part of the pharmacopœia, and it is from them that Professor Maisch obtained the volatile toxicodendric acid, supposed to be the poisonous principle. One would, therefore, hardly expect cases of poisoning in the early spring or before the leaves are well developed.

The plant abounds on this island. On April 29th a young soldier of this garrison presented himself with well-marked symptoms of dermatitis venenata affecting the arms and face; I could hardly believe that at this early date poisoning by *Rhus* was possible, and, therefore, inquired into the circumstances. I found that the patient had, with several comrades, been hunting snakes under rocks covered with the *Rhus*-vine, and that two of these comrades were similarly affected. Two or three days later a little girl who had been playing in the vicinity of the same rocks developed the usual characteristic eczematous rash, and doubt was no longer possible. At the time these cases were contracted the vine was (and is mostly still at this writing) perfectly bare; no leaf was visible and the buds were only just beginning to swell. We are, therefore, forced to the conclusion that the poisoning was produced by the stem—that is, by the active principle, presumably, contained in the young sap exuding or evaporating through the bark. The little girl mentioned above was much exposed to the *Rhus* during the whole of last summer without ever being poisoned. Does it follow, therefore, that it is more active in the early spring than later in the season, and that the poisonous principle is, at least, as much in the stem as in the leaves? As this question can only be solved by the comparison of many experiences, I submit it to the readers of GARDEN AND FOREST in the hope that they will make a record of their own observations in its columns.

V. Havard.

In the Pines.

FOR more than a quarter of a century vegetation has never been so backward in the Pines as it is this year. The birds, too, were very tardy in coming, but they are all here now in full force. Both the Baltimore and Orchard orioles are specially abundant. We almost despaired of our catbirds, for not until the 6th of May did they make their appearance in our neighborhood. The thrushes, vireos, wrens, orioles and many others were all here before them, which is very unusual. The winter birds, too, were slow to depart. The whitethroats were still with us the first week in May, and I saw now and then a junco lingering with them after the main body of these birds had gone.

On the 10th of May Apple-trees were still in bloom, but everything is now pushing so rapidly that by the first of June no marked difference in the season of our fruits and flowers will be noticed.

The Pines are beautiful now with Andromedas and the various Huckleberries, and the Sassafras is in full flower and giving a delicious spicy fragrance, together with the Bayberry, which is crowded with fertile catkins, and the fragrant new leaves are rising above a setting of old ones, which seem loath to give up their hold to this new generation. I see no appreciable effects of the severe winter on any of the evergreen plants, shrubs or trees in the Pines. This, no doubt, is largely due to the protective snow which was unusually deep during the coldest weather. The foliage of our charming Pyxie and the Arbutus is both more luxuriant and fresher looking than usual; they are out of flower, but the little Wind Anemone is still in bloom, and also numerous Violets. The Wild Strawberry almost carpets the ground with white in some places.

Large clumps of Euphorbia Ipecacuanhae are showy in white sandy places, with dense masses of purple foliage and greenish flowers. The wild Columbine is swaying its graceful flowers on its slender stems, and the wild Lupine, with its straight, upright spikes of blue flowers, is in striking contrast.

Almost every year the Pines are invaded by some wandering plant from foreign parts, which settles down and makes itself at home among the old inhabitants. This spring, for the first time, I see the *Sherardia arvensis* has become a fixture on our roadsides. It is welcome, as it is a little delicate thing with whorls of six small leaves around the square stems, and small blue flowers surrounded by a thick involucrum. This pretty plant can never become a pest, like its European relative, *Galium Mollugo*.

Pyrus arbutifolia is in flower, as well as some belated specimens of *Amelanchier*, but the latter is mostly in fruit, and promises an abundant harvest. The Swamp Maples are handsome with thick clusters of flaming red keys, and it will not be long before the brilliant Laurel and the Magnolia and *Xerophyllum*, with many other attractive flowers, will amply repay excursions in the Pines.

In the garden a white single Rose, one of the *Rugosa* type, commenced blooming on the 10th of May, and is now white with large beautiful roses. This is one of Mr. Dawson's plants. Other single white Roses in the garden are from two to three weeks later than this.

Great clumps of the German Iris are making a good display in the border, and some of the more choice Columbines are very attractive. But for brilliant color there is nothing better than a mass of scarlet Poppies, which are now in all their glory.

Mary Treat.

Vineland, N. J.

Foreign Correspondence.

Primulas.

THE genus *Primula* has a special fascination for horticulturists, a large number of species being included in our popular plants for the Alpine garden, while others are valued as pot-plants for cultivation in the conservatory. The Royal Horticultural Society holds a special exhibition of *Primulas* every year, accompanied by the reading of papers and discussions by specialists, which are of sufficient interest and importance to be called a Conference. At the exhibition this year a large number of plants were shown in flower, and papers were read by Mr. Baker, F.R.S., and others. Although the season has been most unpropitious for plants of the nature of alpine *Primulas*, yet the collections shown were almost, if not quite, equal to those of previous years. The *Auriculas* were well represented, and, as usual, received a large share of attention from the laity, who are, as a rule, uncertain whether they ought to admire or be amused by such quaintly colored flowers. Polyanthus are not popular in English gardens nowadays, and yet there are few herbaceous plants that will produce such an effective display of brightly colored flowers as these do in spring under the most ordinary treatment. But after all, the species, true and undefiled, are the élite of *Primulas*. Mr. Douglas showed a first-prize collection of twelve, which were a delightful picture; they were *P. mollis*, *P. Japonica*, *P. rosea*, *P. denticulata*, *P. verticillata*, *P. Cashmeriana*, *P. floribunda*, *P. Auricula*, *P. obconica*, *P. amœna*, *P. intermedia* and *P. decora*. These are all first-class garden-plants. One of the most charming corners in the rock-garden at Kew just now is a peat-bog of about four square yards filled with tufts of *P. rosea*, all in full flower, and as bright in its rose color as the *Chionodoxa* was in its blue a few weeks ago.

A list of the species of *Primula* in cultivation in English gardens would comprise at least fifty. There were thirty in flower in the Alpine house at Kew a few days ago. Mr. Baker, in his interesting remarks on the botany of the *Primula*, said that whereas twenty years ago the number of species known was between seventy and eighty, we now know about one hundred and fifty. The increase is largely due to discoveries in India and China. To quote Mr. Baker's own words: "We have now about one hundred and fifty species, of which, in round numbers, fifty are Chinese and Japanese, fifty are Himalayan and the other fifty are spread through Europe, northern Asia and

America." There are some distinct and handsome plants among the new discoveries in western China, which, however, have still to be introduced into cultivation. It would be worth the while of some enterprising nurseryman to send a collector into the districts made botanically famous by the missionaries, David and Delavay, and by Dr. Henry, many of the plants collected in Yunnan, etc., by them being such as would find general favor with horticulturists.

A paper by Mr. Self-Leonard, an enthusiastic trade-grower of Alpine plants of all kinds, dealt with the cultivation of *Primulas*. He divided them into three classes: (1) Species for the greenhouse, comprising *P. obconica*, *P. Sinensis*, *P. mollis*, *P. verticillata*, etc.; (2) large, strong-growing, hardy species, generally of the easiest culture, and comprising such noble garden-plants as *P. denticulata*, *P. Japonica* (an excellent plant for massing under trees), *P. capitata*, *P. Sikkimensis*, *P. Stuartii*, etc.; (3) the smaller and choicer Alpine species. For these he claimed a style of beauty altogether their own, which made their separation from their coarser brethren, both in the garden and in the exhibition hall, essential.

The cultural requirements of the plants of the third class were not, in Mr. Self-Leonard's opinion, of a special character, but, broadly speaking, they thrive under the same treatment as the *Auricula*, except that they do not require so complete a rest in midwinter, and at other times they do not need the continuous care and studied culture necessary to produce good *Auriculas*. Protection from the excessive wet in winter and spring rather than from cold is needed, most of them enjoying the low winter temperature if kept dry. On the other hand, many of them are all the better for protection from summer heat. The cooler climate of northern Europe always suits *Primulas* better than that of the south; for instance, they grow better in Scotland than in most parts of England.

The soil recommended was loam with a little sand, rather heavy than light, and an avoidance of peat in every case. A chalk soil is not, in his opinion, essential to the culture of any *Primula* and is poisonous to some of them. "Experience conclusively proves that those alpine *Primulas*, which, in nature, are only found on calcareous soils, can be easily grown in our gardens without a particle of chalk or lime in the soil." Mr. Self-Leonard, like all experienced cultivators, attaches comparatively little importance to the soil. He condemns "nostrums" and commends an intelligent interpretation of nature's teaching by the light of the cultivator's experience.

A third paper by Mr. Douglas on the *Auricula* dealt chiefly with their cultural requirements if intended to win prizes at exhibitions. He condemns indiscriminate crossing, especially between plants of the different sections, a bastard, inferior in all respects to its parents, being generally the result. The *Auricula* has had its devotees in England for about three hundred years, but only during the last century have the show varieties been classified according to the variegation or coloration of the flowers. Thus now we have (1) green-edged varieties which have white centres, black or blackish maroon zones and a margin of dark green; none of the plants in this class have powdered leaves; (2) gray-edged varieties, characterized by a thick coating of white farina on the outer margin, through which the ground color partially shows; (3) white-edged varieties, in which the powder on the margin is thick and uniformly white; (4) selfs, which have white eye-like centres and an unshaded margin of blackish maroon, purplish blue or red; in fact, any color that can be obtained, but it must be clear and unshaded. The meanness of the foliage in some of the varieties is so excessive that they are known in some localities as the "Dusty Miller." Mr. Douglas exhibited a fine specimen of *Primula auricula* grown from a little plant collected on the Swiss Alps fifteen years ago, and which he has had under garden-culture in rich soil ever since. Although, as he says, it had increased a hundredfold, it had not altered in the slightest in the size, form or color of the flowers. In

breeding new sorts, Mr. Douglas, after carefully selecting his breeders, considered himself lucky to get one seedling in a hundred that was worth growing for further trial. This applies only to the show or edged Auriculas, seedlings of the alpine varieties being generally of good quality and far less variable. Of course, all the named varieties are propagated by offsets and division. The seed should be sown as soon as ripe, usually about midsummer, and kept in a cool shady place. It germinates freely in the following spring, and the seedlings are pricked off as soon as they are large enough to be handled with safety. They are again potted into single pots, flowering, as a rule, in the second year from the sowing of the seeds. As a rule, a full-sized plant can be grown in one year from the seed-pot or from an offset. The offsets are planted in small pots and kept under shaded hand-lights till well rooted. The right season for repotting is May, the soil to use is good loam, and the position for the plants during the summer is in an airy frame on the shaded or north side of a building or wall. Mr. Horner has said that many people failed with Auriculas because they would set them out under garden-hedges, much to the enjoyment of snails and caterpillars, or keep them in cold damp pits or even down in areas. The successful grower has cool, light, airy houses or frames for them, and with these conditions, plus an intelligent knowledge of the nature of the plants, no department of floriculture yields greater or more lasting pleasure than that of Auricula growing.

London.

W. Watson.

Plant Notes.

AKEBIA QUINATA.—This vigorous twining plant is generally used for the covering of fences, arbors and the like, and it will quickly spread over large surfaces. But while it is most useful for that kind of work, it is also interesting when trained as an upright bush on a border or lawn, or when allowed to ramble over some shrub which is of little value. The prettily shaped leaves, which are digitate, are unlike those of most other vines, and they hold their shape and color well into the winter. The flowers, while lasting only a short time, are exceedingly pretty; the female flowers open first, and are more showy than the male flowers, being of a rich claret color, and two or three times as large as the others. They possess the additional merit of being very sweetly scented. A good way to train the plant to a bush form is to stick a few good stout tree branches in the ground; it will soon ramble over them and make a most beautiful object. The reason that this vine does not ripen fruit more frequently is probably owing to the fact that it flowers so early in the year, and that it produces the female flowers first, and these are nearly past before the males have had time to ripen their pollen. Occasionally, however, individual plants in this country and Europe produce fruit. In Japan its long, slender, pliable shoots, which are of uniform size throughout, are much used for wicker-work and even for baskets, trays and sun hats. Cuttings of the ripened wood put in a cold frame about the beginning of September will root quickly. The plants need considerable sunlight for their best development.

EXOCHORDA GRANDIFLORA.—This Pearl Bush, as it has been aptly called, is now altogether the most striking shrub in Central Park, although most of the specimens there have been allowed to grow into disagreeable open shape, which, together with thin foliage, makes a rather unattractive plant when out of flower. In New England this is not a long-lived shrub, and rarely attains a height of more than six or eight feet. South of this it becomes a small tree, or a shrub from fifteen to twenty feet in height. If cut in hard after it flowers every year it can be held to something like a compact shape, but if left to itself it has a better effect with some lower-growing shrubs massed in front of it to hide its naked stems. This is by no means a new shrub, having been known to cultivation for nearly half a century,

but for some reason it has never become as common as its near relatives, the shrubby Spiræas. Its great beauty consists in its large flowers, which appear with the leaves in long axillary racemes. They are borne in great abundance and are of a dazzling white. Large plants in this latitude produce seed freely, so that the plant is readily propagated in this way.

LILY OF THE VALLEY, FORTIN'S VARIETY.—This is a variety of French origin, and though it was distributed a few years ago by Peter Henderson & Co., and perhaps others, it does not seem to have created much of a stir, and it is not much grown in American gardens. It is a noble variety, much more vigorous and larger in all its parts than *Convallaria majalis*. The stem is tall and is clothed with flowers over twice the size produced by the ordinary variety under the same treatment. The bells are of the purest white.

IRIS STATELLÆ.—This is a Sicilian variety of *Iris lutescens*, and is one of the most attractive Irises, of medium height, which flowers at this time. It has large prominent standards, tongue-shaped and smaller reflexing falls. The flowers are of a pearly-white color, of very fine form and most distinct. It is a fine garden variety and excellent for decoration.

New or Little-known Plants.

A Blue Water-lily from Mexico.

THE handsome Water-lily * figured on page 206 was collected by Mr. T. S. Brandegee near Mazatlan, Mexico, in November, 1893. The flowers, which vary somewhat in size, are sometimes fully six inches in diameter and are of a pale blue color. The stamens are yellow, with long anthers and minute tips. The leaves are nearly orbicular, with few teeth, greenish above, with a few blotches, and of a dark purple beneath. The flowers were obtained from a small pond in an enclosed pasture containing about a hundred plants. Although those were the only specimens seen, the plant was reported to grow in abundance about the neighboring river. I am not quite sure of the species, but it appears to be nearest *Nymphaea elegans* of Hooker, which was figured in the *Botanical Magazine* in 1851, table 4604. Mr. Brandegee's specimens agree almost exactly with this figure, except that the flowers are considerably larger. *N. elegans* has until recently been one of our rarest species, and for nearly forty years remained uncollected (*Bull. Torrey Bot. Club*, xv. : 14). In late years it has been frequently sent in by such well-known collectors as Mr. C. G. Pringle, Mr. G. C. Nealley and Mr. J. E. Bodin. The original specimens of *N. elegans* are said to have come from New Mexico, but all our recent collections have been made from Texas. The species has not been reported from the west coast of Mexico, and this fact, taken in connection with the difference in size of the flowers, leaves some doubt as to above reference of these specimens. It certainly belongs to no other Mexican species with which I am familiar.

Department of Agriculture, Washington.

J. W. Rose.

Cultural Department.

The Rock Garden.

THE winter, just past, proved to be one of the most trying of recent years for vegetation on rock-work. On the first of May the plants seemed two weeks behind time, but the dry, hot weather of the past week has hurried all spring flowers into bloom, so that everything has caught up. We cannot complain of many specific losses, but much injury has been

* *Castalia elegans* (Hook.) Greene, *Bull. Torrey Bot. Club*, xv. : 85 (1888).—*Nymphaea elegans*, Hook., *Bot. Mag.*, t. 4604 (1859).

Leaves nearly orbicular, a little longer than broad, $\frac{1}{2}$ by $\frac{1}{2}$ inches, with 7 or 8 radiating nerves on each side of the midrib, otherwise it is somewhat pubescent above, dark purple beneath, the margin nearly entire with very small sharp teeth; lobes overlapping at base except their apices; flowers a rich blue in diameter, light blue; petals brownish at base, light green above with purple blotches, light blue within; outer sepals without a scarious intermediate; inner sepals nearly like the petals; petals 12 to 20, oblong, abrupt; ramification numerous, about 75 filaments broad, yellow; anthers longer and narrower than the filaments, yellowish; the prolonged connective a mere tip, at most $1\frac{1}{2}$ lines long.

done to many fine plants which have usually come through in good condition. It was apparently during the ice storms in February when the greatest damage was done, rather than by severely cold weather at any time, though low temperature was continuous. All the Moss Pinks, *Phlox subulata*, in exposed situations, were much burned. Many European species of *Dianthus*, *D. alpinus*, *D. neglectus*, *D. glacialis*, *D. subcaulescens*, *D. plumarius* and *D. armulatus* (*Cyclops*) are dead entirely. *D. arenarius*, *D. cœsius* and *D. deltoides* appear to be the only ones which have come through uninjured. *Silene Schafta* is among the lost. *Primula rosea* has stood uninjured for two seasons. Now only a few seedlings remain, which evi-

canes of this handsome trailing Rose sixteen feet long and twined them about the trunk of a young Walnut-tree. These stems are now breaking freely more than six feet away from the ground. No better testimony to the extreme hardiness of this beautiful Rose could be desired. We have it trailing over rocks on a rather steep slope. It is appropriately placed, but the space devoted to it is limited. It is clearly a subject for a sunny bank in the wild garden, where it can roam un molested. Bushes of *Andromeda Japonica*, which from some reason or other have never bloomed before, are flowering well this spring. They have always been protected with loose litter, and every autumn they have been well set with drooping racemes of



Fig. 31.—A Blue Mexican Water-lily.—See page 205.

dently have been protected by other low-growing plants among which the seeds had been scattered. Of the *Megasea* section of the genus *Saxifraga*, *M. purpurascens*, is badly burned, while *M. cordifolia* is scarcely touched; the immunity of the latter may be due in part to a more protected location. Many plants belonging to the mossy group of *Saxifrages* are missing, and what are left are considerably browned.

On the other hand, bushes of the Dawson Rose, with canes from eight to ten feet long and arching upward from two to three feet, are not at all touched. Stout plants of the Japanese form of *Rosa multiflora* are green to the ends of the branches. *Rosa Wichuraiana* looks as fresh as it did last autumn. I found

flower-buds. This is indeed a handsome shrub for planting where it can have protection from the direct rays of the mid-day sun. Several bushes of the Polyantha Roses, White Pet Mignonette and Clothilde Soupert, are growing in recesses between the rocks. It may be they are not appropriate subjects for the rock garden, but they have always done well here and have plenty of good green wood eighteen inches or more above ground, while those in a bed especially prepared for them and protected every winter with litter, are killed to the ground. *Ramondia Pyrenaica* came through better even than it did last season. White *Asphodelus lutea*, never supposed to be hardy, is throwing up a strong flower-spike. Sal-

via argentea is making a good spread of its handsome silky foliage for the third year, and is thus proving a good perennial.

Nearly all the Narcissi are over. Jonquils and the old form of *N. poeticus* are all that remain in bloom. The variety *Ornatissimus* comes and goes with *Horsfieldii*, *Emperor* and *Sir Watkin*. Usually the Poets' Daffodil stays with us until the end of the month, when large quantities are used in the ceremonies of Decoration Day. Siberian Squills, *Chionodoxa* and *Snowdrops*, *Galanthus*, all low-growing, early-flowering bulbs, and splendid for massing, are now forming their seed-capsules. It might be worthy of note that all these early spring bulbs can be easily increased from seeds. The capsules will be ready to gather in about three weeks, just as soon as the seeds turn black. If left longer they burst, scattering the seeds all about. They should be sown at once, but will not germinate until the following spring. The young bulbs should be allowed to grow one season in the seedling-box, and transplanted after the ripening process in August. After another season's growth they will be ready for permanent quarters. By being let alone—that is, being simply weeded, instead of hoed—our Siberian Squills have increased fourfold during the last five years, seedlings coming up every spring, outside the original patch, in batches like young Onions.

Admirers of alpine plants, who can find time to weed instead of hoe, will find their work quite full of interest. It will, however, often be our duty to weed out some beautiful plants. We soon lose all affection and admiration for a plant, however beautiful, when once it becomes aggressive. Years ago we had several species of *Potentillas*. All had handsome Strawberry-like leaves and yellow or brown, saucer-shaped flowers, but they spread so extensively that we have been weeding them ever since. *Alyssum saxatile* and *Dianthus deltoides* are other plants which need to be thinned considerably to be kept within bounds. *Viola cucullata*, in white, purple and striped, rapidly spreads. Whatever we find inspiring we allow to bloom when they do not interfere with other plants, and pull them out when summer comes. On the contrary, there are others we can scarcely have too many of. *Mertensia Virginica* is one of these. Just now its nodding cymes of incomparable blue are springing up everywhere between the rocks and along the paths, where really they ought not to be. The rock garden must not be artificial, so we leave them. Periwinkles, now in splendid bloom, are growing out into the paths, compelling one to make a detour; most of us would rather do this than cut it away. *Campanula Carpathica*, *C. turbinata* and *C. caespitosa* are other plants which come up in all sorts of places, and we are loth to disturb them. *Oenothera Missouriensis*, once planted on the higher levels, is spreading, step by step, down the slope. It is a handsome trailer, and ought to grow so as to overhang a ledge, where it can be seen from below. The Japanese form of the Chinese Bell-flower, *Campanula pumila Maresii*, whose clear blue flowers associate so well with the dwarf Golden-rods in autumn, is another desirable plant which we like to see spreading itself. Alpine and Iceland Poppies, now hybridized, and with double forms, appear in the clear gravel paths, and grow there as vigorously as anywhere. Our native Columbine, *Aquilegia Canadensis*, though rather intrusive, is, nevertheless, one of the most welcome spring-blooming plants. Occasionally purple forms appear, showing that some late-blooming plant of the species has been hybridized by some of the earlier-flowering plants of *A. cærulea*. I do not, however, think any beauty comes from this cross, and feel disposed to weed them out, lest in time too many of them appear. *A. Skinneri* takes care of itself fairly well, but the Siberian, *A. glandulosa*, makes no headway, and dies out after a year or two.

T. D. Hatfield.

About Tulips.

THE ruin of the Tulips in flower last week by a few days of hot weather, followed by rains, is a thing to be expected any year. The conditions should serve as a warning against growing only one class of Tulips or those which flower at the same time. Those who are tempted into making barbaric masses of color by planting a bed of Tulips, all of which are certain to flower at once, are apt to secure a short-lived, if vivid, pleasure. When one has Tulips of all sections he not only has a display extending over a number of weeks, but a storm or hot wave has only a temporary effect, and the pleasure is never brought to a sudden stop by bad weather.

According to the Tulip fanciers' standards there are very many with bad form and worse color, but if one is not versed in points, and simply enjoys color, there are not many very ugly Tulips, though there seem to be many of flimsy texture. Except *Tulipa Greigii*, which stands alone for beauty and dis-

tinctness, the original species are not as handsome as many of the Dutch hybrids, yet there is a character and distinction about most of the species which makes them attractive and pleasing garden-plants, and they often serve as a foil to the regularity and formality of the hybrids. Of course, one must except the Parrot Tulips from the formal ones. As a rule, I think it will be found that the species, except, possibly, *T. Greigii*, are more reliable and regular in flowering from year to year than the hybrids, which, under rude treatment, soon run out. One often finds Dutch hybrids with distinct traces of *T. sylvestris*, but this species for a mass of yellow is unsurpassed. It is of a good rich color, is pleasantly fragrant and of rapid increase. An Italian form of this sent out by Dammann last year was very good. *T. Schamki* is a beautiful Tulip, white flushed rose, which gives one the earliest flowers, though it is said by Nicholson to be a synonym of *T. Gisneriana*, which "is evidently the original stock of most of the late-flowering kinds."

Other species there are in the garden, but none so distinct from the ordinary kinds as the small low-growing Asiatics, which are so suitable for a rockery. These have small flowers of various colors, sometimes with short scapes and broad leaves, as in *Tulipa ciliatula*, and again taller scapes and narrow leaves, as in some forms lately collected by Mr. Whittall on the Madcan and Naz Daghs. It is now the season of the late-flowering *Bybloems*, *Bizarres*, etc., the old favorite garden Tulips, which possess dignity of stature and richness of coloring of a quiet character. Mr. P. Burr has lately been busily collecting some forms of these from old English gardens, remnants mostly of English seedlings. A collection of these at present in flower contains many fine forms; on the whole, rather brighter than the Dutch kinds, though among these are colors which can be spared.

Elizabeth, N. J.

J. N. Gerard.

Narcissus Notes.

THE flowering season of *Narcissus* is nearly past now, and only the midseason and late varieties of *N. poeticus* remain to bloom. The experience of this year has not added to the knowledge of the various kinds in cultivation. One thing is certain, however, in this country, that if the climate or soil does not suit any particular kind of Daffodil it will be surely apparent the spring following the first summer's growth in a weak start and sparse flowering, while hardly a trace of the plants will be left the next year. Of those that have disappeared I cannot call to mind a single kind that I would care to have again, and the best sorts thrive and increase at a surprising rate. Mr. Gerard said, in his last notes on this subject, that a bad memory is a good thing to carry at times in the garden, and this is forcibly brought home to me at times when near the Daffodil beds. It has often been noted in these columns that during summer these beds are filled with annuals such as *Asters*, *Mignonette* and others, and last fall when these were past a workman was instructed to clear off the remains, and in his anxiety to clear away everything he pulled up about seventy *Narcissus* labels. This will explain why a detailed list of losses cannot be given. The better-known and larger-flowered varieties can, of course, be identified, but the bulbs belonging to the *Burbidgei*, *Leedsii* and *incomparabilis* sections had better be lifted and naturalized in the Grass, as has been done with surplus stock of the Poets' *Narcissus*. In places where many spring-flowering bulbs are used there is abundant room for planting the cheaper kinds in the sod where the grass is not cut until midsummer. We have tried this plan with success in an orchard under the Apple-trees. No care was taken to prepare the soil or even disturb the sod; a spade was thrust into the soil and a bulb put in each place, and I am inclined to believe that if the newer Spanish kinds had been treated in this way they would have lived longer and flowered well, while under the treatment given to the stronger-growing garden varieties they soon died; perhaps from cold, as we never cover the beds in fall unless the bulbs are planted late; it may have been from too generous treatment, as has been suggested.

We have been particularly fortunate in having the so-called white varieties live and do well. *Albicans*, *Colleen Bawn*, *Moschatus*, *Leda*, *Mrs. J. B. M. Camm*, *William Goldring*, have all done well and flowered each year, but we take care not to manure them in fall as we do the others that are grown for cut flowers.

One of the gems of the border is the Irish form of the double Jonquil, with the astonishing name of *Narcissus odorus plenus Hibernicus*. We have had it four years, and it never fails to bloom, and increases each year. On the contrary, *N. capax plenus* has disappeared. *N. biflorus* is another of the

uncommon kinds that do well. It is very late in blooming, and resembles the Tazetta section in general appearance, having several flowers to each stem, and these fragrant. Muticus, the last of the Trumpet Daffodils, has taken longer to die than any other, and there are still a few left. These were evidently collected bulbs, as no two were alike, but they did not take kindly to cultivation. We have now a fine reserve stock of bulbs to dig from to grow in pots in winter. Home-grown stock is far preferable to any that can be imported, and after flowering these are replanted in among the shrubs, and in two years are as good as ever. Those who intend to plant Daffodils will do well to make out a plan of the bed after the work is completed, and keep it for reference. Had this been done in our case the loss of our labels would have been less of a disaster. No one can go amiss in planting such kinds as Emperor, Empress, Horsfieldii, M. Foster, Grandee, Countess of Annesley, Princeps, Golden Spur, Obvallaris, Sir Watkin and Henry Irving. Maximus and Ard Righ have not done so well as we anticipated, and have now almost died out.

Border culture has one disadvantage in that after every April shower the purity of the flowers is marred by the earth that has been splashed over them, and there seems to be no way of preventing this except by planting in the grass; this we shall try on a much more extensive way next fall. Regular masses should be avoided, or the effect would be more or less artificial. I have seen acres of the common kind growing wild in pastures in the southern counties of England, and cattle do not seem to eat the foliage, or these wild Daffodils would have been extinct long ago.

South Lancaster, Mass.

E. O. Orpet.

Coreopsis grandiflora.—For cut-flower purposes or for a border plant there is nothing which bears yellow flowers to equal *Coreopsis lanceolata* and *C. grandiflora*. I was never aware of its value as a pot-plant until this year. We wintered a few plants in a cold frame in five-inch pots and brought them indoors about the middle of January, and a shift was given them to eight-inch pots about the middle of April, when the flower-stems were well advanced. Since the last week in April our plants have been loaded with flowers some three inches in diameter, borne on fine stems eighteen to twenty-four inches long. For cutting this *Coreopsis* is much superior to any other variety, and its easy cultivation should ensure its wider use as a pot-plant. We sow our seed in the open ground the last week in July, and those required for indoor use should be potted about the end of October.

Taunton, Mass.

W. N. Craig.

Dionaea muscipula.—This little plant, popularly known as Venus' Fly Trap, well deserves a place in the greenhouse. The ordinary observer may look on it only as a curiosity, but to the plant-lover it has a beauty all its own. The upper portion of the leaf, which constitutes the trap, is dilated into a two-lobed irritable limb, furnished at the margin with a row of long stiff bristle-like teeth. When a fly or other insect alights on the inner side of this portion it immediately folds up and holds the insect while it makes the least motion, but gradually assumes its normal position again after the insect is killed and ceases to struggle. It is of easy cultivation and does well in a greenhouse temperature and should be placed in a position where it will be shaded from direct sunlight, but at the same time have abundance of light and air. First place the plants in small pots half filled with crocks, using live sphagnum moss as potting material, then place the pots about six in a ten-inch pan, and pack them firmly around with sphagnum, place the pan in a saucer and keep this all the time filled with water.

Tarrytown, N. Y.

William Scott.

Saponaria ocymoides, a dwarf-growing perennial Soapwort, from the south of Europe, is one of the few really good rock-work plants which stand our hot summers; it has very pretty pink or red flowers, produced in such great profusion as almost to cover the foliage from view. Seed sown in the fall will give flowering plants for the following spring. Cuttings root well enough in a cold frame, but seedlings are preferable, as they form more bushy plants than those from cuttings.

Fritillaria imperialis aureo-marginata.—The variegated Crown Imperial is a most striking object now in the herbaceous border. The common kinds are handsome when well developed, but this form has, in addition to its flowers, beautifully variegated foliage. The Crown Imperials ought to have a place where they can remain undisturbed during the summer, as after flowering they soon die down to the ground. It is well to have the places where they are planted indicated by a good

stout label. As it is an early bloomer, this species is very liable to get hurt from cold winds, therefore a sheltered position is desirable.

Botanic Garden, Washington.

G. W. O.

Correspondence.

Winter Storage for Tender Evergreens.

To the Editor of GARDEN AND FOREST:

Sir,—Two years ago I imported from England about a hundred tub plants for the decoration of my terraced garden. The invoice included *Cephalotaxus Fortunei*, *Cupressus Lawsoniana* and several garden forms, *Taxus elegantissima*, *T. baccata*, etc.; *Ilex crenata*, *Evonymus*, Box, Portugal Laurel, Holly and *Retinospora*.

This spring more than half of the plants are dead or dying, owing, I think, to faulty management during the winter. I shall esteem it a favor if some of your correspondents will enlighten me as to the best methods of winter storage and care of such plants. My storage-house is of brick, fifty feet by twenty on the floor and eighteen feet high, with perfect means of controlling light and temperature. The questions I should like to have answered are: Can the above-named plants be satisfactorily wintered in common? If yes, what should be the light and temperature of the storage-house, and the arrangement of plants with reference to sources of light and ventilation, and how much watering should they receive?

Weston, Mass.

Francis Blake.

[The above inquiry invites attention to the fact that there are many beautiful evergreens which cannot endure the outdoor rigors of a New England winter, but which in suitable quarters can be easily carried through the trying season, and then be most useful plants for decorating lawns and terraces in summer. The variegated Hollies, *Evonymus*, Yews and various forms of *Cupressus*, *Retinospora*, Laurel, Sweet Bay are all in this class. It should be understood at the outset that all these plants will stand a large amount of cold, and in the moister climate of Great Britain they very frequently go through periods when the temperature ranges very near the zero line. Owing to the better maturing of the growth here in fall there is no reason to doubt that the evergreens named above would endure even more cold here than in Great Britain; but our cold weather is often accompanied by winds of high velocity, while the sun is as high in our skies during February and March as it is in Great Britain in May and June. This combination of hardships is too formidable for these choice evergreens which have been developed under more equitable conditions of climate. An illustrative case is that of the common English Ivy, which is fairly hardy even here in Massachusetts if planted on a north exposure, but a southern aspect is sure death to it the first winter. Taking it for granted, then, that a frost-proof structure is not essential to these plants, the matter of providing a place of storage for them is much simplified. Ours are placed in the cellar under the coach-barn, where it freezes every winter soon after the advent of really cold nights; but once frozen, there is no thawing out until the month of March, and there is never any need of watering until after the plants are taken out-of-doors. As long as this complete rest is obtained without admitting air by means of ventilators, all goes well, but should the structure be actually frost-proof, it will be necessary to give air enough to bring down the temperature to from twenty-five to thirty degrees; it may go lower than the first, but never higher than the last-named figure until the time arrives to prepare to get them out in spring. Pure air is, of course, essential; asphyxia and dyspepsia are as common symptoms in the vegetable as in the animal world. If a cellar is used, perfect drainage must be secured and no deleterious gases that the plants cannot breathe should be admitted. An excess of ammonia from adjacent horse-stables, for example, might be fatal. The soil should be made porous by good drainage, and the admixture of charcoal and lime refuse with it is advisable on account of the purifying action of both these substances.

Tubs are the best receptacles for these plants, as the

wood is a good non-conductor; slate or earthenware will heat in the sun sufficiently to damage the roots in hot weather. Great care is necessary in the culture of plants in tubs to prevent the ingress of earth-worms. If the tubs be placed on the ground the moisture will attract them for a great distance, and the drainage will soon become clogged and ill health will follow. Wherever it is possible, as, for example, on terraces, it is best to place the tubs on masonry. If not, they should be elevated on bricks to give a circulation of air, and if earth-worms have already made an entrance they may be driven out by the application of clear lime water; it is possible to use the same lime to make several applications of lime water, as water will hold only a certain quantity of lime before becoming saturated. Of course, Ericaceous plants cannot be treated in this way. Lime water would be fatal to Rhododendrons, Kalmias, Andromedas, Leucothoës, and all plants that have the fine hair-like roots characteristic of the Ericaceæ.

If the foregoing essentials are carefully regarded there should be no difficulty in wintering any of the shrubs named by your correspondent. It is possible that some one of these, either in construction or treatment, has been lacking, and if it is supplied no further trouble will be experienced. For terraced gardens these shrubs are almost indispensable, and in some locations terraced gardens are indispensable.

E. O. O.]

Wayside Shrubbery.

To the Editor of GARDEN AND FOREST :

Sir,—I have just returned from a drive, rather more than half a mile of which was on a byroad, which means a narrow strip of wheelway somewhere between stone fences, which, by the law of the state, are set two rods apart. There is little travel on this cross-road, and, therefore, the roadmaster has kindly allowed its borders to take care of themselves for two or three years past. When the wayside shrubbery gets too aggressive he will go in some fine June morning with his axe and cut down some of the most vigorous trees and shrubs and burn them, but in a year or so the place will be as wild as ever. In this thicket the wild Plums have gone out of bloom, but the young Apple-trees which the birds have planted are still in flower, and the Scarlet Fruited Thorns are at their best. There are great masses of bright Pinxter-flowers, and the graceful racemes of the Choke Cherry are unusually abundant.

Of course, the leaves at this season are quite as beautiful as the flowers, and from the deep red of the young seedlings of Swamp Maples to the gray of the Dwarf Willows and the light yellow of the Sassafras there are tints without number. Wild flowers smile all along the sides of the road; Violets and Anemoneellas, Mandrakes, and, most beautiful of all, the Columbines, unite with the shrubberies to make pictures of rich and varied beauty, and new ones greet the wayfarer at every step.

No doubt the "inescapable joy of spring" makes everything look beautiful at this season, but this byroad will continue beautiful all summer long, and have fresh attractions every day in the way of foliage, flowers and fruit. I am writing of this simply to say that all through the hilly parts of our eastern states every road can be made just as beautiful if the margin of it is only left to take care of itself. Why should not societies similar to Village Improvement Societies be organized in townships to protect all this beauty instead of paying roadmasters for devastating every roadside? How many people are there who really believe if their attention is once called to the matter that naked stubs and stones and ground burned black is more beautiful than a natural growth of a wayside vegetation?

Denville, N. J.

M.

. Rhododendrons in a Hard Winter.

To the Editor of GARDEN AND FOREST :

Sir,—In reply to your inquiry as to the effect of the past winter on my Rhododendrons, I would say that they have not suffered to any considerable extent. The winter was not unusually severe here, the lowest record being ten degrees below zero, and yet it is true that in this vicinity many collections have suffered rather seriously. Every year my faith is strengthened in the theory that Rhododendrons are more apt to suffer in this country from drought in summer than from cold in winter. We do have a winter occasionally in which

plants are injured, but this is not always from serious cold; during the past year, for example, a large portion of the damage showed itself in the latter part of the winter, and it, therefore, seems probable that our bright sun in March sometimes scalds the foliage when it is covered with frozen sleet. For this reason I have made most of my plantation on the north side of a belt of evergreen trees, and I have found that these always suffered less than plants which have a southern exposure; and this is especially true of such varieties as are generally considered half-hardy. This year I noticed that large healthy plants of *Album grandiflorum*, for example, in a sunny and sheltered border have been quite killed, while varieties as tender as J. Walter and Kate Waterer, planted in the shade and only a few feet distant, are all right. I enclose a memorandum of some of the best varieties which I have been growing for the last few years, nearly all of which have not suffered in the least during the past winter, although a few of them have been slightly touched: A. Adie, Blue Bell, Hamlet, C. S. Sargent, Mrs. C. S. Sargent, F. L. Ames, F. L. Olmsted, James McIntosh, Sefton, P. Simon, Princess Mary of Cambridge, Silvio, Vauban, Duke of Teck, J. H. Agnew, Mrs. Heywood, Lady Grey Egerton, Bacchus, Lothair, J. Marshall Brooks, J. Walter, Kate Waterer, Mrs. John Clutton, Ralph Sanders, Mrs. Shuttleworth, Duchess of Sutherland, J. D. Goodman, Pelopidas, Countess of Normanton.

Wellesley, Mass.

H. H. Hunnewell.

Shy Wood Plants.

To the Editor of GARDEN AND FOREST :

Sir,—In an illustrated article sometime ago on *Phlox divaricata*, GARDEN AND FOREST speaks of it as somewhat rare, and though I find it quite common in the woods here I am at a loss to know how such a shy plant can hold its own for any length of time anywhere. It is never found except in part shade and in soil made almost entirely of leaf-mold, so light that in exposed places it would require the leaf and root fibers to keep it from blowing away. It lives the most precarious life in semi-cultivation, and I have always lost every specimen after two or three years. The partiality the garden-slugs have for *Phlox* has something to do with its disappearance, but it must be classed as tender, or perhaps uncertain is the better word, along with Bee Balm, Claytonia, Hepatica, and not a few others which cling to the woods, not probably from choice, but because one needs the winter protection and another the light soil afforded there, and also the freedom from the sod that drives them all from the fields.

Nearly all wood plants are obliged to flower in the early spring before the trees put out their leaves and live a semi-torpid life the rest of the season. Cannot some evolutionist show us how the rise of the sod-producing Grasses has not only driven them to the woods, but also changed their time of flowering to accommodate them to their condition of enforced seclusion?

Buffalo, N. Y.

John Chamberlin.

Recent Publications.

Dictionary of Orchid Hybrids. By E. Bohnhof. Paris: Octave Doin.

This little manual contains a list of all artificial hybrids among Orchids which were known up to the beginning of the present year, with the name of their introducer and the date of their appearance. The plants supposed to be natural hybrids are also placed in the list, and tables are added to indicate the seedlings which have been obtained from each species. This will be a useful list for all who wish information as to the origin of hybrid Orchids, and those who are engaged in hybridizing will find it serviceable by showing in a compact form what has been accomplished with each species. It is proposed to publish a new edition of this dictionary every two years, so that the list can be kept as nearly up to date as possible.

Notes.

There is no more showy flower just now in the border of hardy perennials than the cut-leaved Peony, *Paeonia tenuifolia*, which blooms several days earlier than the ordinary garden varieties of *P. officinalis* and *P. albiflora*. The single-flowered variety, with its solitary dark crimson cup-shaped flowers on stems a foot and a half high, is much more rare

and rather more handsome than the double-flowered form, although the latter is very beautiful. These plants need nothing but fairly rich and deep soil and they will continue to flower year after year.

During the first week in May two hundred and twenty-four car-loads, amounting to nearly 64,000 boxes, of oranges, were sent from Riverside, in southern California. It is estimated that the value of the entire orange crop of the section which ships fruit from this town will sell for \$750,000.

The first small shipment of Peen-to peaches, from Florida, arrived last Friday, and regular supplies are expected this week and hereafter during the season. Fine Early Alexander peaches, grown under glass in Massachusetts, bring fifty cents each, and hot-house melons cost a dollar and a half apiece. The finest Porto Rico pineapples retail for one dollar each. Muscat grapes, from Cape Colony, are still coming in limited quantities, but the clusters are small, and persons who are willing to pay for grapes at this season prefer the more showy products of the hot-house.

In a paper on Cannas, read by Mr. James I. Donlan before the New York Florists' Club last week, he speaks of the American seedling Columbia as being of a new and distinct type and altogether a noble plant. It grows only from two to three feet high and is of a stocky habit, with large dark green foliage of leathery texture. The flower-spike often branches so as to give the effect of three or four trusses of bloom at once, each of these appearing as a separate spike. The color is a rich cardinal-red with a scarlet gloss toward the end of the segments, and the immense trusses of red flowers borne on plum-colored stalks give the plant a very distinguished appearance:

The first sweet corn of the season came from Bermuda by Monday's steamer, and was offered by Mr. Kelly, the leading dealer in Washington Market, at seventy-five cents a dozen. It was well grown, and after the voyage of thirty-six hours the husks and kernels looked as fresh as they usually do in warmer weather when coming from neighboring gardens. Parsnips, sweet potatoes and other winter vegetables of good quality may still be had, and, besides fresh products from the south, kohlrabi and most delicate cauliflower are brought in from neighboring hot-houses. All early spring vegetables are now in good supply, but the best asparagus, green peas and wax beans, with new squashes and cabbage from Florida, still command high prices.

The second annual exhibition of native flowers collected by the Science Class of the Normal College of this city, was made in the library of this institution during three days of last week. The collection was tastefully arranged on a half-dozen long tables, many species and varieties of wild flowers from eighty-two different genera being represented. The display of flowers was not only beautiful in itself, but it was also interesting and instructive in the scientific accuracy with which the flowers were arranged, each order being grouped by itself and each specimen being carefully named. Not the least interesting table was the one bearing specimens of Grasses, Mosses, Ferns and branches of trees in blossom. The exhibit was altogether creditable, and, besides its value to the students and collectors, showed to the visitors, what many of them had never realized before, the beauty and great variety of the native flowers now in bloom in this locality. Most of the specimens came from Pelhamville and Staten Island. An admission fee of fifteen cents was charged and this was to be for the benefit of the Alumnæ Kindergarten.

On the sidewalks the itinerant dealers are busy selling branches of Pinxter-flower, Dogwood and Black Haw, and even the expensive flower-shops are decorated with Mandrake, *Podophyllum peltatum*. Commercial flowers are very abundant, but they are of poor quality, and it is hard to get first-class roses and carnations. The best Madame Cusin roses bring only \$1.00 a dozen; Brides and Bridesmaids, \$1.50 a dozen; American Beauty, \$1.00 to \$5.00; Baroness Rothschild and its white sport, Mabel Morrison, \$3.00 to \$4.00; Ulrich Brunner, \$3.00 to \$5.00, and General Jacqueminot, which are more scarce than some other sorts, \$2.40 to \$4.00; Moss rose-buds are seen in most of the best stores, and these cost \$2.00 a dozen. Well-grown carnations of the Helen Keller, Dean Hole and Albertina varieties bring seventy-five cents a dozen, but the average price for good flowers of other varieties is fifty cents, and fairly good carnations may be bought on the street for thirty-five cents a dozen. A few paeonies have come, and some forced gladioli. Of Dutch bulbous plants a few Parrot tulips and late Poets' Narcissus are all that are left. One of the prettiest flowers now sold is the yellow Sweet Sul-

tan. Sweet peas and lily-of-the-valley are favorites, and in special demand at this season, and lilacs are offered at prices that are merely nominal.

A *Farmer's Bulletin*, just issued by the United States Department of Agriculture, gives many interesting facts about the cultivation and use of Sweet Potatoes. The most northerly state where this crop is extensively cultivated is New Jersey, although crops have matured at the experiment stations in Lincoln, Nebraska, and Geneva, New York. The Sweet Potato is most commonly propagated by means of buds from roots planted in hot-beds, and the shoots as they develop are planted in the field. Cuttings from these vines are often rooted and transplanted for the main crop. The plant rarely matures seed in the United States. Ninety days after the sets are transplanted early varieties will be ready to dig for use. The best growth is made in warm, sandy, well-drained, and even dry, soil. The greatest care in harvesting is necessary to prevent bruising the roots in handling, for the skin is very tender and wounded roots are sure to decay. They are best preserved by being kept in a temperature of seventy-five degrees for a fortnight after digging, and then lowering the temperature and keeping it during the winter at from fifty to sixty degrees in a dry atmosphere. Rather more than two-thirds of the weight of the Sweet Potato root is water. Three pounds of the roots afford as much dry matter as one pound of corn, but only about half as much protein. On sandy soil, however, more dry matter to the acre can be secured with a crop of Sweet Potatoes than with a crop of Corn. The young leaves and tender sprouts of the plant are sometimes prepared and eaten like spinach, and the vines, although they are usually left to decay in the field, can be profitably used as food for cattle. They are better fed green than cured into hay, and they cannot be successfully made into ensilage.

In Bulletin No. 87 of the Cornell Experiment Station, Professor Bailey presents a study of the Dwarf Lima Beans which have become so popular. These Beans have been derived from three types of the Pole Lima. The first of these types is the so-called Sieva or Bushel Bean, *Phaseolus lunatus*. Henderson's Dwarf Lima is a sport from this, the original plant having been found more than twenty years ago by a negro along a Virginia roadside. The Lima Bean of American horticultural literature comes from the variety *macrocarpus* of *P. lunatus*. There are two types of this Bean, the one known as the Potato Lima, with tumid or nearly spherical seed, the other as the Flat Lima, with large, soft, veiny seeds, tall growth and late maturity. The Thorburn, Kumerle or Dreer Dwarf is a form of the Potato Lima, and the Burpee came from a dwarf plant of the large White or Flat Lima. There is a fourth Dwarf, the Barteldes, from Colorado, which has little to recommend it for cultivation here. It is derived from *P. multiflorus*, the Scarlet Runner or Painted Lady, which is cultivated generally as an ornamental plant here, although the young pods and ripe beans are excellent for the table. These dwarf Limas are all valuable, since they are from two weeks to a month earlier than the Pole varieties. They are so productive that in the north it is possible to secure a greater total yield per acre from them than from the old varieties, since the plants require less room. We have often spoken of the relative value of these Beans. Henderson's is the earliest. The plant is compact, the most productive, and continues the longest in bearing, and the small, flat, clear white beans are of as good quality as any Sieva Bean, though not so rich and buttery as the true Lima. The pods also escape the mildew, which is often serious upon the late thick-podded sorts, and its combination of merits insures a place for it in every garden. Another Dwarf known as Jackson's Wonder is also of the Sieva type, differing from Henderson's in having the beans brown-speckled, the plant being rather less dwarf and compact and a trifle later. The Thorburn, Kumerle or Dreer Dwarf is a bush-plant with no tendency whatever to climb, only moderately productive, and rather late, its white tumid beans having the excellent qualities of the Potato Lima, which by many people is considered superior even to the large white Lima from which Burpee's Bush Lima is descended. This last is a true Lima, somewhat taller than the Thorburn, occasionally reaching a height of two feet, the flat seed as large as those of the Pole Lima; season medium to late, or about three weeks later than the Henderson, and about the same as that of the Burpee, and rather more productive than that variety. Mr. T. Greiner considers the Dreer Bush Lima as the best bean in quality, but he notices as a drawback to the usefulness of the plant that the pods grow so closely together and so near the ground that they are in danger of becoming soiled and rotted before the beans are fit to use.

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLE: —The Debt of America to A. J. Downing.....	211
The Chino Valley Experiment Station.....	Charles H. Shinn 212
The Saguenay Region.—III.....	Rev. E. J. Hill 213
PLANT NOTES: —Rhododendron Vaseyi.....	214
CORPORATE DEPARTMENT: —Orchard Notes from Western New York.....	Professor L. H. Bailey 215
Hardy Cypripediums.....	J. N. Gerard 216
Some Hardy Perennials.....	Robert Cameron 216
Some Useful Greenhouse Climbers.....	William Scott 216
Cyperus alternifolius.....	W. N. Craig 217
Native Violets.....	G. W. O. 217
CORRESPONDENCE: —The Hardiness of Pinus palustris.....	Joseph Meeks 217
Notes from Wellesley.....	T. D. Hatfield 217
Lewisia rediviva.....	Charles H. Shinn 218
Taxation for Municipal Improvements.....	Luther G. Sand 218
RECENT PUBLICATIONS	219
NOTES	220
ILLUSTRATION: —Blood-root, <i>Sanguinaria Canadensis</i> . Fig.	212

The Debt of America to A. J. Downing.

WE can hardly realize that it was not until some years after the middle of the present century that any American city had begun to make provisions for a public park. New York already ranked among the world's great cities, with a population of more than half a million souls and rapidly increasing, and yet it had no grounds for public recreation, no pleasant roads for riding and driving, no opportunities for refreshing contact with natural scenery. There are half a dozen cities in the country now whose park area is measured by thousands of acres, and yet in 1851, when Mayor Kingsland, of this city, had been spurred to the point of proposing to devote as much as one hundred and sixty acres of an unpopulated portion of Manhattan Island to public use as a pleasure ground, the project was denounced by many eminent citizens of that time as extravagantly large. The change of popular sentiment between that day and this is certainly very marked, for now not only have large areas been secured in the suburbs to meet the future wants of the growing city, but our Legislature has just passed an enactment compelling the destruction of entire blocks in the most thickly peopled parts of the city in order to make space for gardens and playgrounds.

No one who has looked into the history of public parks in American cities and the development of the public sentiment which brought them into being, will deny that the strongest impulse which the movement received at the outset came from Andrew Jackson Downing. Mr. Downing was born with a strong love of nature, and as his father was a nurseryman he was brought up in a calling that increased his interest in trees and planting. Reared almost in sight of many of the old places on the Hudson which had been planned and planted by Parmentier and others of that older school, he learned while still young that a landscape could be made impressive by the simplest and most natural treatment. As he was to become our first authoritative writer on the art of landscape-gardening, the whole country has occasion to be thankful that he was in this way led to adopt what was then called the English style of gardening, in which, to quote his own words,

"the spirit of nature, though softened and refined by art, always furnished the essential charm, thus distinguishing it from the French or Italian style, where one sees the effects of art slightly assisted by nature." Downing was a man of catholic views, but while he realized the fact that vases and balustrades and studied symmetry might be mingled with foliage enough to make a garden, yet his ideal garden-scene was the primeval paradise, whose pervading beauty was found in the unstudied simplicity of nature. With his natural taste refined by travel and by study, Downing's Treatise on the *Theory and Practice of Landscape-Gardening*, which was published in 1841, became at once the accepted text-book of rural art in this country, and this book, passing through many editions, and his *Rural Essays* and other works, are still classics in this branch of literature. It was his example and precept which inspired such men as Henry Winthrop Sargent, and they in turn kindled the enthusiasm of younger men, so that the best private gardens in America to-day owe what is best in them to his sound teachings.

Downing was a graceful and forcible writer as well as an artist of the highest intelligence, and as he had been already recognized as an authority a timely series of letters which he wrote for *The Horticulturist* on the subject of public parks in 1849 had a marked influence in creating and molding popular sentiment in this direction. These essays, which appeared month after month, and were widely copied by the press, marshaled in a convincing way the arguments which were then fresh and original, although many of them have since become a part of our common knowledge and belief. He began by showing that public parks were needed not only to educate the public taste, but because everybody at some time felt the necessity for this contact with nature. He showed that this communion was not only a delight to people who were as unsophisticated as children, but that the more thoughtful and educated a community became the stronger grew the passion for rural pleasures. When it was argued that the people would not visit parks, even if artistic ones were constructed, he pointed to the large cemeteries to prove how eager all classes were to avail themselves of an opportunity for a visit to anything resembling a park. Mount Auburn, Greenwood and Laurel Hill had been already established for a quarter of a century, and that they had come to be places of resort was certainly not because they afforded opportunity for solemn meditation or for the artistic value of the monuments reared within them. He truly argued that it was because they contained bits of forest-land, hills and dales, copses and glades that they attracted throngs of visitors in cities which possessed no great public gardens, and that if thirty thousand people would visit Laurel Hill in one year many times that number would visit a public park in a city like Philadelphia. He set his argument on the highest plane at the very outset, and, while recognizing the use of parks as helping to furnish air and sunshine, he held that the fostering of the love of rural beauty was quite as important an end, and that such a love of nature helped to civilize and refine national character. Mayor Kingsland's proposed park of a hundred and sixty acres he pronounced altogether too scant, and argued that five hundred acres between Thirty-ninth Street and the Harlem was the smallest space that should be reserved for the wants of the city, since no area less than this could furnish a rural landscape or offer space enough for broad reaches of park-land with a real feeling of the breadth and beauty of green fields and the perfume and freshness of nature. It was argued by some who assumed to represent the laboring classes that the park would be monopolized by those who ride in their carriages, and, on the other hand, some of the wealthy and refined people of the city complained that a park would certainly be usurped by rowdies and low people. It is refreshing now to read Downing's replies to such objections. He stoutly asserted that these social horrors were nothing but phantoms of the imagination; his faith was, as the event has proved, that

rich and poor could breathe the same atmosphere of nature and of art and enjoy the same scenery without any jealousy or any conflict.

The actual work of constructing Central Park was not begun until six years after Downing's untimely death, but it was his stirring appeals that aroused the city to feel its need, and provision to meet it quickly followed. By rare good fortune, too, designers were found, whose artistic temperament and training were akin to his own, so that our first great urban park was planned on such broad lines as he would have approved. The works which followed at once in Brooklyn, Buffalo, Chicago, San Francisco and other cities were beyond question the result of this same inspiration, so that his keen foresight and conscientious devotion to an idea were the most powerful of the agencies which united to initiate the movement which has given to American cities their thousands of acres of park-land during the past thirty-five years. When we think of the health and comfort, the rest and the refreshment, the delight to the eye and the imagination which these smiling landscapes have given and will continue forever to give to all the people, it is not too much to say that Downing takes rank among the greatest benefactors to his country which this century has produced. It is now more than forty years since he met death in trying to rescue others. Is it not time that some memorial of him should be erected in the park which his genius secured for the city? There are too many statues now in Central Park, such as they are, and it may be that a statue is not the most appropriate way of commemorating the work of such a man as Downing. But somewhere in grove or glade it is certainly possible to place a fitting memorial to one whose life was devoted to the cause of rural art. We are glad to know that this thought has occurred to more than one person lately, and that a movement is partially organized to carry it into effect. There can be little doubt that enlightened Americans will delight in an opportunity to keep green the memory of our earliest master in horticulture and landscape-art.

The Chino Valley Experiment Station.

THE large farm station which the University has established in the Chino Valley, Southern California, is situated about equidistant from three important towns, Chino, Ontario and Pomona. It is in a very prosperous region, embracing many varieties of soil, different elevations and exposures, and consequently different climates. Near the mountains the rim of the valley is largely occupied by orchards of citrus fruits. On the Chino side the leading industry is beet-culture for sugar, one of the most famous factories in the United States being located here. The total output of refined sugar last year was 9,471,672 pounds.

The experiment station occupies two pieces of land. The home tract, thirty acres in area, is near the middle of the valley, and irrigation is necessary here to secure the best results with most crops. The other tract, ten acres of moist land requiring drainage, is two miles distant, and represents quite a large extent of country. Though the home tract is more typical of the valley as a whole, some of the best sugar-beets come from the rich, moist bottoms. Both tracts, together with the water-supply needed for the larger, were given by Mr. Richard Gird, owner of the famous Rancho Chino, when the station was established.

The station orchards comprise Olives, Figs, the Citrus fruits and deciduous fruits, besides experimental vineyards of wine and table grapes, including the new Persian varieties recently introduced, and considered of especial value for warm districts. Twenty acres are now occupied by permanent plantations. The orchards and vineyards are well kept, and every tree is distinctly labeled, besides being on the record books. The large orchard book shows in the case of each tree the plat, the row, the number, the name, the source from which stock was obtained, the age when planted, and the date of planting. It then gives the

records of bearing for each successive year—the date of bloom and of ripening, quality of fruit and total yield, with space for memoranda. A more complete record is kept separately for each species of fruit. The charts show every point where soil has been analyzed, or experiments tried, and the results from time to time obtained.

The orchards of various trees in this station will, in two or three years more, when trees now in nursery are set, contain upwards of twelve hundred varieties. Some kinds are represented by but one tree, but others require several specimens so as to make more careful tests, or because they are on somewhat different soils.

The University has already under cultivation at its stations 240 varieties of Apples, including Crabs; 25 varieties of Almonds; 45 varieties of Apricots; 75 varieties of Cherries; 70 varieties of Figs; 20 varieties of Nectarines; 250 varieties of Peaches; 175 varieties of Pears; 120 varieties of Plums and Prunes; 20 varieties of Walnuts and 30 varieties of Citrus fruits, besides Persimmons, Mulberries and many other fruit-bearing trees.

Everybody who has attempted to establish an experimental orchard knows that after the first hundred or so varieties are obtained the task of selection becomes one of increasing difficulty. The plan at the Southern California station is to secure standard varieties for comparison, and promising seedlings from the Pacific coast, the southern states, Europe, Australia, Japan, and other regions with similar climates, discarding or sending to another station those varieties that prove inferior here, unless some other characteristic renders them useful for hybridizing. Georgia, Alabama and other southern states have contributed some of the most valuable seedling Peaches, not only for cultivation, but as parents of new varieties. The Chinese Flat Peaches, so useful in Florida, have never been popular in California. The Chinese Cling type is considered very desirable in some regions. The Chino Valley seems particularly well adapted to the Almond, Prune, Peach, Apricot, Olive and Orange, and less suited to the Cherry, Apple and Pear, although fair results are expected with the latter fruits in certain localities.

A brief synopsis of the work accomplished at this station since its formation will serve to illustrate some of the local advantages. July 14th, 1890, Professor Hilgard chose the site, reporting that the thirty acres consisted of reddish mesa soil and gray gravelly soil, the former predominating. The moist land tract was a dark, rich loam. About the end of November, 1890, the University took charge of the station, a house and barn having been meanwhile built, and water secured through a three-inch cement pipe.

February 19th, 1891, orchard-planting was begun, the land by this time being cleared, graded and plowed. Owing to heavy rains and an unusual overflow from the adjacent wash, or winter channel of one of the numerous creeks, planting was not completed until the middle of April, fully a month later than is desirable. About 800 fruit-trees, representing 365 varieties, were set in orchard form; seventy-five varieties of Grapes were planted in the vineyard; ten named varieties of Date Palms, and many other rare trees were also secured, and a nursery was commenced. The culture plots included the leading cereals, Sorghums, forage-plants, etc.

During the summer of 1891 a circular reservoir of cement, containing 100,000 gallons of water, was constructed on the highest point of the thirty-acre tract. The streets surrounding the land on two sides were graded, and the following winter choice shade-trees were planted around the entire tract. The orchard and vineyard were enlarged and a collection of some twenty species of *Vitis* was added.

During the summer of 1892 a small greenhouse was built and the offices considerably enlarged. The deciduous fruits received no irrigation; the Citrus fruits were watered three times during the summer. Peruvian Cotton, five varieties of true Sugar-cane, Cassava, Tobacco and a large collection of varieties of Sweet Potatoes were grown this year. Some of the Grapevines planted in 1891 bore fruit.

In 1893 further additions were made to orchard and vineyard. The older vineyard bore well, and so did some of the Peaches, Almonds, Cherries, Plums and Apricots. Four varieties of Orange-trees planted in the summer of 1891 bore five or six fruits apiece. Twenty varieties of Sweet Potatoes were grown, and were analyzed at the Central Station. Collections of small fruits were commenced.

In 1894 the fruit crop was large. Nearly all the Olives, Peaches, Oranges, Lemons, Almonds, Plums and Prunes, Apricots, Figs and Cherries yielded more or less liberally. Some of the Apples and Pears also bore to some extent. Small fruits were very abundant. During the winter of 1894-95 an orchard of special fruits on selected stocks was commenced on ten acres of moist land.

Extensive experiments with Sugar Beet culture were carried on each year on a larger scale. In 1894 about five acres were devoted to this crop. Many successive plantings on different soils, using all the leading varieties of seed and analyzing both soil and beets as often as deemed necessary, led to results, considered locally, of prime importance to the beet-sugar industry of the Chino Valley. These experiments are being continued on a still larger scale the present season. A small chemical laboratory has now been fitted up for the foreman, who is competent to make the simpler analyses on the ground.

But a little more than four years has elapsed since the first planting was done at this station. The visitor now sees orchards and vineyards in bearing, a garden of Roses, shrubs and various flowers, a small arboretum of choice ornamental trees, extensive culture-plots, varying from year to year; and, in brief, the materials in readiness for much experimentation. This has been accomplished in four years by the toil of one foreman, who has had one laborer the whole time, and a second man only about nine months in the year. It is a record of which the University may well be proud.

Charles H. Shinn.

Niles, Calif.

The Saguenay Region.—III.

POTENTILLA TRIDENTATA, a low plant with smooth, evergreen leaves, covered dry rocks where a thin coating of soil gave its woody roots a chance to grow, and still showed some of its white flowers near the end of August. **Potentilla Anserina** crept about in the low, sandy ground at the mouths of streams which entered the bay, and **Ranunculus Cymbalaria**, with its small, round leaves and spreading stems, covered wettish or muddy spots in similar localities. In the moist, grassy land, near the mouth of Mars River, our wild Forget-me-not, **Myosotis laxa**, grew, and some sprays of **M. versicolor**, a low hairy plant, resembling **M. verna**, but with yellow flowers, changing to blue or violet, were taken from waste ground in the streets of Chicontimi, where it had been introduced. Two small annuals of the Figwort family, **Euphrasia officinalis**, Eye-bright, and **Rhinanthus Cristi-galli**, the Yellow Rattle, were common in rocky fields and on grassy slopes, the tiny bluish flowers of the former exceedingly pretty when peeping out from the low grass of lawns and pastures, the latter rather stiff and homely with its conspicuous, inflated pods. From dry rocks at "Cross Point," near the mouth of the Saguenay, were gathered some specimens of a Whitlow Grass, **Draba incana**, var. **arabisans**. Its floral season had passed some time before, but the tufted branches near the root, well provided with small oblanceolate leaves, hoary with stellate hairs, gave interest to it. From the same rocks, near the water's edge, were plucked the handsome flowers of the Beach Pea, **Lathyrus maritimus**, a very common plant along the sandy shores of the Great Lakes. Near by, on wet rocks or by the banks of brooks, grew the Hemlock Parsley, **Conoselinum Canadense**, the tallest stems, with their finely cut compound leaves, making of it an attractive plant.

Marine plants were quite abundant, for the tide sweeps up the Saguenay, rising to more than twenty feet at the head of Ha-ha Bay, rushing into the coves and covering

many of the low-lying rocks, and bringing in brackish water. In the tide-swept mud along the shore were **Tissa marina** and **Plantago maritima**. The latter was very variable in size and appearance, growing also in the crevices of rocks wet by the tide. Here it might be but two or three inches high, with cylindrical leaves, scarcely thicker than a needle, but when growing in the clays the leaves might be half an inch wide and half a foot or more in length. The Sea Milkwort, **Glaux maritima**, grew upon the wet rocks and sands at Tadousac, and close by tide-water, near the mouth of the Saguenay, the Scotch Lorage, **Ligusticum Scoticum**, was found. **Solidago sempervirens** grew in various places by the river. It has thick smooth leaves and showy heads with golden-yellow rays, characteristics which bring it into prominence as it stands on the wet rocks or slopes, usually close to tide-water. **Atriplex hastata** was met with along the river and in waste ground at Chicontimi, for it is weedy in its habits. It is, in consequence, not restricted to marine conditions, but has become an abundant weed in the salt regions of western New York, and is common about the Great Lakes, even spreading away from them along the road-beds of railroads.

The Compositæ were quite well represented. Among the more interesting was **Aster macrophyllus**, in the open woods or along their borders; **A. acuminatus** on the shaded slopes, generally poorly furnished with flowers, the stems sometimes bearing but one or two heads. **A. tardiflorus**, a low plant with pale violet rays, appeared occasionally in the damp soil of shady places. **A. umbellatus** was one of the most common Asteris in the damp thickets or along the streams. **A. Novi-Belgii** grew upon the wet rocks, its medium-sized heads, with rays of bright violet-blue, making it an attractive species. A form of **Erigeron Canadense**, about a foot high, covered with pink or pinkish flowers, made a pretty plant and caused its weediness to be overlooked. A few were seen in the gravelly deposits at the mouth of Mars River. It reminded one of a similar deviation from the normal form of the common Milfoil, occasionally found in the wild state, and which has obtained a place in the flower-garden, where the white flowers have given way to those with rose-colored rays. With its fine sprays of flowers the Butterweed was almost as neat a plant florally, and did not seem a greater variation from the type.

One of the most interesting Golden-rods was **Solidago bicolor**, with its whitish or cream-colored rays, and growing mostly on the rocks. Though generally grayish, with short pubescence, when in the shade of cliffs or under evergreens, it became quite smooth in the variety **concolor** and had very green leaves with a surface almost shining. **S. lanceolata**, when on the rocks, had thick leaves, with somewhat the same shining, evergreen appearance. Sometimes it would be much dwarfed, and but five or six inches high in such situations. Among the Pines on the higher ground and ridges, the mountain species, **S. macrophylla**, was seen. It has a wand-like stem and showy heads, which are large for a Golden-rod. The bright green leaves were not at all remarkable for size, as its name might indicate. **S. uliginosa**, a species with larger leaves, found a congenial place on the wet rocks, though oftener seen in sphagnous swamps. **S. juncea** and a slightly hoary or minutely puberulent form of **S. humilis** were taken from rocks on the banks of the St. Lawrence at Tadousac. The latter strongly reminded one of **S. puberula**. Two of the Hawkweeds, **Hieracium scabrum** and **H. Canadense**, were on the common Pine plains and gravelly banks. **Prenanthes altissima** was a frequent plant by the margins of woods and in rocky ground, with a great variability in the shape of its leaves and in height of its stems. **P. serpentina**, with much thicker and less variable leaves, grew very abundantly in the sandy ground at Tadousac.

Some of the introduced plants proved of interest, especially the weeds with which I was less familiar at home. **Thlaspi arvense**, the Mithridate Mustard, or Penny-cress, was sparingly found at St. Alphonse, its broadly

winged flat pods suggesting a greatly enlarged fruit of the Shepherd's-purse, and quite pretty in their way. The Bugloss, *Lycopsis arvensis*, a small, but very rough, hairy plant, was occasionally seen in the dry fields. In the grain-fields were the Corn Spurry, *Spergula arvensis*, and *Sonchus arvensis*, the large heads of the latter, with glandular bristly involucra and bright golden-yellow rays, being rather handsome. As it sprang up in the Oat-fields, which had apparently been plowed over in the spring, it had all the appearance of an annual, or, at least, of a plant fruiting the first season from the seed. This also seemed evident from an examination of the root, which was not a creeping root-stock, but with the main axis vertical and with smaller branches, as in the roots of the more common Sow Thistles. Of Vetches I noticed *Vicia sativa* and *V. hirsuta* in the Wheat-fields or mixed with the Pea-vines, while along the field-borders and in the fence-rows was the native Vetch, *Neracca*. Though mostly weeds, and somewhat troublesome, the neat pinnate leaves and bright flowers of purple or blue make handsome plants of these Vetches. The little Hop Clover, *Trifolium procumbens*, abounded in the dry fields and meadows. *Euphorbia Peplus* frequently appeared as a weed in waste ground. In such places the Mugwort, *Artemisia vulgaris*, was very common, as well as the widely disseminated *Ranunculus acris*. The Bladder Campion, *Silene cucubalus*, grew up in the field-borders, and when among bushes became very slender and three feet tall sometimes. The flowers generally perfected but five stamens, the five remaining ones attaining but half the usual length, or appearing as short rudimentary stubs at the base of the calyx-tube. The Abbé Provancher, in his *Flore Canadienne*, perhaps alludes to a more extreme case of this barrenness, stating that the flowers are sometimes subdioecious.

Chicago, Ill.

E. J. Hill.

Plant Notes.

Rhododendron Vaseyii.

THE attention of our readers has often been called to the value of this Carolina plant in northern gardens, and on page 377 of the first volume of GARDEN AND FOREST a figure of it was published. Its hardiness has now been satisfactorily demonstrated in the neighborhood of Boston during the past winter, which has been one of the most severe on plants that has been experienced in the last quarter of a century, killing the flower-buds of most varieties of the so-called Ghent Azaleas, in which are mingled the tender Pontic Azalea and some of the American species. So severe have the effects of the winter been that many old plants of the Ghent Azaleas have been killed to the ground; the evergreen Rhododendrons have suffered seriously and the Japanese Retinosporas and other conifers are killed or badly mutilated. Rhododendron Vaseyii, however, is blooming better than ever and the pure pink flowers are delightful. It is not an evergreen species, and, like the Rhodora, to which it is more closely related than to any other American plant, it loses its leaves in the autumn and does not regain them until May, after the flowers begin to fade. Although in its mountain home Rhododendron Vaseyii sometimes grows to the height of eighteen feet, in cultivation it begins to flower when less than a foot high, and as the flowers open with those of the Poets' Narcissus it is suggested that a good combination could be made by planting a mass of this Rhododendron and then filling up the place between the plants with the Poets' Narcissus. The perfect clear pink of the Rhododendron flowers combine perfectly with those of the Narcissus, and both plants enjoy moist and not too well-drained soil.

Our readers will remember that Rhododendron Vaseyii is one of the last of the conspicuous plants discovered in eastern America, and that it was not until 1878 that Mr. George R. Vasey found it near Webster, in Jackson County, North Carolina. Subsequently it was detected in Cashiers'

Valley, in South Carolina, and still later on the slopes of Grandfather Mountain, in North Carolina. Among the plants of its class none surpass it in beauty, hardiness and the ability to flower profusely year after year, and when better known it will, doubtless, become a general favorite.

The Ghent Azaleas are certainly very beautiful, but many of them are not hardy, and those which are able to bear the New England climate often lose their flower-buds in severe winters. The species of eastern America will, therefore, be found more satisfactory for general planting in our severe climate; their flowers cannot boast, it is true, the range of colors that have been obtained in the more delicate hybrids, but the hardiness of the plants compensate for this; and by selection and hybridization between the eastern American species a race may be produced free of the Pontic strain, which has weakened the constitution of the Ghent breed. English raisers of Azaleas have been using of late years the California Rhododendron (*Azalea*) occidentale to cross with the Ghent Azaleas. It is a very beautiful white-flowered species, and some of their new hybrids are very handsome, but Rhododendron occidentale is, unfortunately, tender in our climate, and the crosses from it will not probably be very satisfactory here.

CARAGANA ARBORESCENS.—This Siberian Pea-tree is now in bloom in the parks of this city, and its bright yellow flowers appearing among the light green downy leaves make it really attractive. These flowers are often said to resemble those of the Laburnum, but really the flowers of the Laburnum, as they appear in long graceful racemes in England and other places where the climate suits the tree, are much handsomer. The Laburnum, however, does not thrive in this country except in a few favored locations, while the Caragana, by its perfect hardiness and its adaptability to all sorts of soils, is a plant that we can always depend upon. It sometimes reaches a height of twenty feet and assumes a genuine tree shape; it will bloom when it is only three or four feet high, and it has a special value in that it produces flowers of a color which is comparatively rare at this season. These Pea-trees, for there are a number of species and varieties in cultivation, belong to the Leguminosae, and, with the exception of the Red Buds, they are the earliest of the family to flower.

SANGUINARIA CANADENSIS.—The Blood-root is among the most attractive of our early-flowering plants, and although the petals fall quickly, when growing in a mass, as it is usually found in nature, fresh flowers continue to appear for several days. These are white, star-shaped and solitary, with a yellow centre. The flower-bud comes out of the ground from the thick root-stock with the leaf wrapped snugly about it. As soon as the leaf opens the scape lengthens, so that the flower is lifted well above the kidney-shaped leaves. These continue to expand after the flowers are past and reach considerable size, so that a mass of them is highly ornamental. The plant thrives in a well-drained soil, but it needs moisture, with some shade, and it does best where it can revel in peat and leaf-mold. It is easily cultivated when these conditions are supplied, and, as Mr. Horsford has pointed out, it does better when planted in clumps of at least six to ten roots, perhaps because the broad leaves shade the ground and keep it cool. When growing wild it is oftenest found in fence corners and similar places where the dead leaves are swept together by the wind, no doubt because mulch of this sort is so effective in keeping the soil damp and cool, as well as furnishing the kind of food in which it delights. The plant derives its name from the orange-red juice which exudes from its root-stock, and to some extent from the flower-stem when cut or bruised. The photograph of a little group of these flowers, which is reproduced on page 215, was taken by Miss Edith Eliot, of New Bedford, Massachusetts.

ALYSSUM SAXATILE.—This old plant, which has been cultivated for more than a century, makes a very pleasing display just now. It is an excellent subject for the rock garden, and never shows better than it does when its pros-

trate stems are hanging over stone ledges. In a slightly elevated position it thrives the best, for it resents water about the roots in winter. The flowers are fragrant, of a golden-yellow color, and are borne thickly in panicles at the ends of the stems. It is rather shrubby at the base, and rarely grows more than a foot tall. Although it gives the best results in an elevated position, nevertheless it makes a good border-plant in a sunny place when the soil is well drained. It is easily raised from seed. Seed sown in March make large plants by the fall.

ARTHROPODIUM CIRRHATUM.—This is an interesting and attractive greenhouse herbaceous perennial which flowers at this season. It is a New Zealand Liliaceous plant with partly folded grass-like leaves, some two inches broad and eighteen inches long. These leaves are gracefully curved and radical. The flowers are borne in loose racemes on jointed stems well above the foliage. The flowers individually are pure white, with prominent yellow stamens, about three-quarters of an inch in diameter, and the white petals are well reflexed. They endure for several weeks, and the plant is ornamental either with or without them. It offers no difficulties in cultivation, growing strongly in

established practice for three or four years, but it was not until last year that the application of Bordeaux mixture for the scab fungus was extensively tried by apple-growers. Many of these experiments with the fungicide were remarkably successful, and they have had a noticeable effect upon the operations this spring. Few persons are now spraying orchards with Paris green alone, but they are combining the poison with the fungicide, and thousands of acres of orchards are being treated with this combination.

For the most part these applications are well made, and the growers are willing to repeat them two or three times. Yet I am more and more convinced that still greater thoroughness is the secret of ultimate success. The Bordeaux combination adheres to the twigs and foliage for weeks, and I am sure that one thorough application of it is more efficacious than two or three carelessly made. This has been well illustrated in some experiments which I have just made on a large scale for the destruction of the Canker-worm in an orchard in Orleans County. It is well known to experimenters that this rapacious insect is readily killed with Paris green, and yet the greater part of the most painstaking orchardists of western New York who have had experience with it have failed to completely rout it by spraying. Some persons have even used a mixture of Paris green as strong as one pound to forty gallons of water, with indifferent success. The trouble is that the



Fig. 32.—Blood-root, *Sanguinaria Canadensis*.—See page 214.

sandy loam in a greenhouse temperature. It is increased by seeds, division and offsets.

IRIS KOCHII.—Among the large early-flowering bearded Irises this stands distinct among the many purple kinds now in bloom. The large flowers are of a peculiarly rich dark vinous-purple color, which is very effective and striking. Besides the typical *I. Germanica* there are a number of hybrids in the same section with various shades of purple, but none more effective than this Istrian species.

Cultural Department.

Orchard Notes from Western New York.

NEVER before has there been so much interest in spraying orchards, and in the best parts of the fruit sections of western New York nearly all the fruit-growers will spray their trees. The people have now had sufficient experience in the operation to ask most explicit questions about every detail. In the Apple districts of Wayne, Ontario, Monroe, Orleans and Niagara Counties, it is no longer necessary to exhort the fruit-growers to adopt the practice, for they are already convinced and are now chiefly concerned in perfecting the methods and appliances.

Spraying with Paris green for the Codlin-moth has been an

insect appears suddenly in great numbers and eats voraciously. The treatment which is needed, therefore, is not one of great strength, but one of great thoroughness, so that every portion of the foliage may be coated with the poison. The worms must be killed quickly, before they have eaten far, for five or six of these greedy creatures soon dispatch a leaf. On trees where the worms would average this number to every leaf we were able to destroy them all with two applications of a pound of Paris green to 200 gallons of water, and in some cases even a single spray was sufficient. But this spray was liberal and thorough. On old trees we applied as much as six gallons to each tree, while growers in general were using from one to two gallons of a twice or thrice stronger mixture with poor results.

Another remarkable feature of the present spring in the Apple regions is the great number of orchards which have been plowed up and put under clean culture. The repeated failures of the apple crop in recent years have now thoroughly aroused the growers of western New York. For a time they waited, hoping for productive years, as of old; but the crops did not come, and now an effort is making to bring the crops. I doubt if the experiment of reviving old Apple-orchards by tillage was ever tried on such a gigantic scale as it is now being tried in western New York. In the meantime it is gratifying to know that the rural population is at last ready to accept the teachings of investigators quickly and fully.

Cornell University.

L. H. Bailey.

Hardy Cypripediums.

OUR native Cypripediums, while not rare plants, are yet uncommon in cultivation. Few hardy plants are more interesting, and, judging from the number of common names given to them, the interest is not confined to gardeners. The general name, Lady's Slipper, is a contraction of Our Lady's Slipper—that is, the Blessed Virgin's. *C. pubescens* is also known as Moccasin flower or root, Nervine, Nerve-root, Water Nerve-root, Umbil-root, Noah's Ark, Indian Shoe, Bleeding Heart, American Valerian, Pine Tulip, Money-flower, Slipper-root, Venus' Cup and Venus' Shoe, Yellows. By the Indians it was called the Night Hawk's Shoe (*pishko-ta hápe*.—Dakota), Rabbit's Shoe (*tchukfi i-shulush*.—Choctaw), Whippoorwill's Shoe (*kwikohia-otakwa*.—Onadaga). These names have also been applied to the other species. In addition, the Cherokee Indians know *C. parviflorum* as the Partridge Shoe (*Kkwe ulas ála*), and *C. acaule* is known as Old Goose, and *C. arietinum* means Ram's Head Lady's Slipper.

The Cypripediums are among the popular simples, being a gentle nervous stimulant or antispasmodic, used for the same purposes as Valerian-root, *Valeriana officinalis*. It has been claimed that *C. spectabile* and *C. acaule* have narcotic principles. *C. pubescens* is the only one named as *officinalis*, however. It is not possible to discover the annual consumption of the root within a number of tons. Its use has been decreasing in recent years in competition with English valerian.

As garden-plants Cypripediums are apt to be short-lived unless one can manage to secure the rather difficult conditions of rich moist soil in shade and nutrient in the way of decaying vegetation on which they revel. However, if well-formed crowns are secured in the fall the plants will do well for a while under trying conditions. *C. parviflorum* has grown very well in my garden in heavy soil, with a northern exposure, under the shade of a Pear-tree. Just now *C. pubescens* and *C. spectabile*, sent by Mr. Mann from a Tamarack-swamp in Wisconsin, are as vigorous and sightly as one could wish. It is very probable that sphagnum would prove a very successful medium in which to grow these plants in our gardens, taking care to give an occasional dressing of rotted leaves. They are readily forced by planting in pots or flats, which should be kept in the frames and brought into temperate warmth early in the year.

Aside from the interest in growing these wildlings successfully, they seem to me to be among the plants more thoroughly enjoyed if sought out and discovered in their haunts while they are in flower.

Elizabeth, N. J.

J. N. Gerard.

Some Hardy Perennials.

Fritillarias.—The different species and varieties of *Fritillarias* add much to the attractiveness of the spring garden, and it is a mystery why plants so easily grown are not more common. The stately Crown Imperial, in its many varieties, is most frequently seen, and it is the most conspicuous plant in the genus. When well grown its stout leafy stems attain a height of four feet. Its drooping flowers are nearly as large as Tulip-flowers, and they vary in color from yellow to crimson. The flowers are produced in whorls at the top of the leafy stem, which are surrounded by a crown of foliage. The varieties of this plant are numerous, but there are two forms with variegated foliage. One has silver-striped leaves, and the other has gold-edged leaves. The Crown Imperial is not particular about soil, but does best in a light sandy loam well enriched with manure, and a slightly shaded position suits it well.

Fritillaria Meleagris, the Guinea-hen-flower, is a pretty European species, and it has many showy varieties. It does not grow as large as the above species; the stems only attain the height of one foot. The pendulous flowers are produced singly on the top of the stem, and are checkered with pale and dark purple. The white variety of this plant is very pretty, and well worth growing. *F. obliqua* is a neat and distinct plant from the Caucasus. The stems, which are about a foot high, are clothed with numerous oblique glaucous leaves, and its flowers are brown-purple. *F. ruthenica* is another good dwarf species that is perfectly hardy. Its flowers are brown and yellow, and it is about a foot high, with linear lanceolate leaves.

The dwarf kinds are excellent plants for sunny borders, and when set in small groups they are very pleasing. The bulbs when once established should not be disturbed often, and when they are transplanted at any time they should not be kept out of the ground long, as it weakens the plants. The bulbs of *Fritillarias* should be bought early in the season, August or September, and when once procured there should be no delay in getting them into their permanent positions. Large bulbs

should be planted six or eight inches deep, and the smaller kinds from four to six inches deep. Care should be taken not to put the bulbs where water will settle around them in winter.

Anemones.—A beautiful little plant is *Anemone sylvestris*, with its pure white drooping flowers. When nicely grown it has a neat habit, the three-parted leaves spread out and touch the ground and grow up around the flower-stems in a pleasing manner. When it is in flower the plant measures from twelve to fifteen inches in height. It comes from Siberia and central Europe, and is quite hardy here. A light rich soil in a slightly shaded place seems to suit it. *A. nemorosa*, var. *Robinsonia*, when it once gets the right situation and feels at home, is the most beautiful of the Wind flowers. It must be seen on a bright sunny day with all its flowers open, for, under any other conditions, its full beauty is not displayed. The habit of the plant differs little from that of our native *A. nemorosa*, but its flowers are much larger and of a bright sky-blue. It is a British plant, but grows luxuriantly here, and does well in a light rich soil, and a slightly shaded position prolongs the flowering season.

Orobus vernus.—Plants with pea-shaped flowers are rare at this season, and this fact alone would give a value to this *Orobus*. It is an excellent hardy perennial, and would deserve attention at any season. The plant grows about a foot high, and nearly as soon as the growths are out of the ground the flowers begin to appear. At first they are a mixture of green, red, purple and blue, but when they get a little older they turn almost blue. This is a good border-plant when it has good rich soil.

Saxifraga peltata.—At the edge of a small pond this largest of the Saxifrages is throwing up its vigorous flower-stems. These stems, which rise from a stout, fleshy, creeping root-stock, are from eighteen inches to two feet high and three-fourths of an inch thick at the base. The flowers are in large clusters and rose-colored. At this time, when the plant is in bloom, the leaves are about ten inches high and six inches across. Later on the umbrella-shaped leaves increase in every way until they are about a yard high and as much across, and are very bold and handsome. It is a moisture-loving plant, and requires to be planted near a pond or running stream; in such a place it very soon increases.

Harvard Botanic Garden.

Robert Cameron.

Some Useful Greenhouse Climbers.

Hoya carnosa.—This fine old climber still holds its own against the newer introductions. Few, if any, of its rivals are more pleasing in flower and foliage, and certainly none are more suitable for covering a back wall. The plant requires a fair share of light, and with ordinary care it will make rapid growth and soon form a spreading mass of glossy green leaves. It commences flowering in March or April and blooms profusely for several weeks, while occasional blooms appear during the entire summer. The peculiar texture of its sweet-scented flowers has given it the popular name of Wax plant. They are rather unsuitable for cutting purposes, as they are hard to procure with any length of stem, though shoots four or five feet in length may be cut with several clusters of flowers attached. The plant requires plenty of root room, and, therefore, does best in a bed, which should be freely drained. A compost of turf-loam, well-rotted manure and a little sand suits it well. It requires an abundance of water while in active growth, but should be kept rather dry during the winter months. A trellis of wood-work or wires should be provided for support to which the shoots should be tied until the plant is well established, after which they will cling readily of themselves and require only an occasional trimming to prevent overcrowding. This trimming is best done after the main crop of flowers is past, when the plant will make and ripen the young wood for another season's flowering, the greater part of the flowers being procured from the young wood. Shading is necessary during the summer months, as the leaves are easily scorched in strong sunshine. Fine specimens of the Wax plant are often seen in old country houses, where they have been grown for years in a large pot. They are taken in the house in any warm corner for the winter, and in summer are set on the porch, or under a tree where they will bloom abundantly with no other attention than a watering every day or so.

Lapageria rosea.—This plant and its variety, *alba*, would be more common if they were not so difficult to establish. Many failures undoubtedly occur because the potting compost is too stiff or heavy. Peat soil or leaf-mold should constitute about half, the other half being made up of good turf-loam and a plentiful dash of sharp sand. It is hard to give too much

water while the plants are in active growth, providing the drainage is good. They suffer if allowed to become dry during the warm weather, and even in winter should be kept moderately moist, the amount of water given being regulated according to the atmospheric moisture of the house. The flowers are useful for wreaths and similar purposes. Nowhere do the large waxy, bell-shaped flowers show to better advantage than when drooping from the roof of the greenhouse, for which this plant is admirably adapted. It is of slender growth and light foliage and does not obstruct the light from the plants below.

Stigmaphyllum ciliatum.—This plant is well adapted for a similar purpose, but is of more rapid growth and heavier foliage. It is of comparatively easy culture and thrives well in a light soil. The flowers, which are produced in panicles, are of a bright yellow color and very showy. They are easily damaged by damp, and on this account the plants should not be syringed when in flower.

Habrothamnus elegans.—This is another old-time favorite. It is especially useful for training to a pillar from which the graceful drooping panicles of bright carmine flowers are displayed to the best advantage. It can be had in bloom during the winter months if it is well cut in about the end of September. There need be no fear of cutting it in hard, as it starts very readily and may be pruned back as close as a grapevine.

William Scott.

Tarrytown, N. Y.

Cyperus alternifolius.—For decorative purposes this is an extremely useful plant, and for growing in Wardian cases, aquaria or positions where it can have plenty of moisture and not too much sunshine it is unexcelled. Planted in the open ground it makes a very handsome appearance, and it succeeds in either the full sun or a heavily shaded situation. It succeeds best where slightly shaded, and last year grew four to five feet high and three feet in diameter. Those who have some old, rather sickly-looking specimens in pots should plant them out, and they will be surprised to note a fine tropical appearance they will have ere the season is over. The variegated form, *C. alternifolius variegatus*, grows less vigorously with us than the green form, but makes a very pretty plant. As young plants are so easily raised from seed and otherwise, it is not advisable to dig up any plants in the fall; they are sure to lose a large part of their foliage after lifting.

W. N. Craig.

Native Violets.—Under cultivation these plants make a rather pretty display of flowers and foliage. Some of them, however, are apt to become troublesome weeds if planted where the hoe cannot be used freely. The principal offender in this line is *Viola cucullata*, which goes on producing short-stemmed apetalous flowers all through the summer, and these flowers are very abundant seed-producers. *V. blanda* is a good species with white flowers and lots of them; it is about six inches high. *V. Canadensis* is a beautiful plant, with leafy stems, and grows over a foot high; it has also white flowers, tinged with violet. *V. pedata* has several forms, every one of which is beautiful. *V. pubescens* has small yellow flowers and very handsome foliage. *V. sagittata* has very variable foliage and pale purple flowers; in masses this looks well. These Violets seem to prefer a heavy loam with the addition of some vegetable mold. *V. pedata*, in its varied forms, usually grows on hard-baked sandy soil, or gravelly soil, and in such situations flowers sparingly all summer long if there are abundant rains, but usually the plants show best in May and late September.

Botanic Garden, Washington.

G. W. O.

Correspondence.

The Hardiness of *Pinus palustris*.

To the Editor of GARDEN AND FOREST:

Sir,—The note on the hardiness of the Cherokee Rose in a recent number of GARDEN AND FOREST leads me to ask what has been done in the way of testing the hardiness of the *Pinus palustris*? Two years ago we procured a dozen small plants of this species from a point near its northern limit in North Carolina. One only survived the transportation, but this one has lived through the past two winters here with no protection. Even the severe one just past has not materially hurt it. The uppermost leaves are brown and dead, but the lower ones are green. Further than this it is now making a vigorous growth from the crown. The plant is only about fifteen inches high, and it was under the snow part of the time, but there were terms of very severe weather when it was entirely uncovered.

Germantown, Pa.

Joseph Meehan.

[The condition of the plant of this Pine, which has been

growing for many years in the grounds of the Department of Agriculture in Washington, shows that, while it can be kept alive there, it has no ornamental or economic value much beyond the limits of its natural range.—ED.]

Notes from Wellesley.

To the Editor of GARDEN AND FOREST:

Sir,—Mr. H. H. Hunnewell's grounds are open to the public and they are visited by thousands of plant-lovers every season. The superb collection of rare and beautiful conifers and splendid specimens of rare trees and shrubs from all parts of the world are the main attraction to some of the visitors, while others come to see Lake Waban as it appears when looking over the Italian garden of trimmed trees, the finest in the United States. The exhibition of Rhododendrons and Azaleas in June is a special treat to many persons. Mr. Hunnewell has a magnificent collection of Rhododendrons. It may be a question whether the more tender kinds, in which Asiatic blood predominates, will ever be really hardy here. Mr. Hunnewell has, by extreme care in regard to suitable location, and attention to watering during dry weather, succeeded in retaining some of the tender ones in excellent health. Years ago crimson shades were rare, now there are several good varieties of this color.

During the late summer the English flower-garden proves a great attraction. It is a flower picture, a mass of color, effectively arranged in one part of the garden shut in by a rectangular evergreen hedge. The Water-lily tank, heated by hot-water pipes, and containing such tender kinds as *Nymphaea Devoniensis*, *N. Zanzibarensis* and *N. stellata*, as well as some of the handsomer of the hardier kinds, notably *N. chromatella*, has many admirers. A special bed of Japanese Iris is provided with water-pipes, laid so that it can be overflowed during the blooming season—an essential condition to the proper cultivation of these plants. A canopy is spread over them to protect the delicate and many-hued flowers from the scorching rays of the sun.

The conservatory is considered private, but no one is ever refused permission to view the splendid collection of Orchids always on exhibition there. Mr. Hunnewell's Orchids are selected mainly for spring and summer effect. There is just now an immense basket—crate, one might call it—of *Cattleya Skinneri*, and another of its charming white-eyed variety, *oculata*. The brilliant violet-purple of these flowers is very effective. With its fragrant, lemon-yellow, pendent flowers, *C. citrina* is here exceptionally well grown. *Laelia cinnabarinus* and *Ada aurantiaca* give the touch of orange-scarlet needed. *Dendrobium nobile*, in many fine forms, and *D. Wardianum* are indispensable here, as elsewhere. Other Dendrobiums in flower are *D. fimbriatum*, orange-yellow, with dark brown, almost maroon, eye, and fringed lip; *D. Brymerianum*, clear yellow, with a still more fringed lip, and *D. thyrsiflorum*. These add variety and beauty to an attractive group. *Schomburgkia Tibicanis* is a rare and most interesting Orchid, very seldom seen. The plant now in flower bloomed two years ago for the first time in this country. It is a somewhat coarse grower, producing but few flowers in proportion to the size of the plant. They are pink and white and finely penciled.

In the annex to the conservatory, which is open to the public, there is a fine display of spring-flowering plants. It is interesting to note how effective such old plants as *Antirrhinums* are for grouping. There are some finely selected kinds, one of wine-purple being very showy. Another effective striped one, Mr. Harris says, he used to know many years ago as *Caryophylloides*. Azaleas are here used to help the display, although there is a special exhibit of these plants in pots plunged to the rim in a tent in another part of the grounds. *A. orbicularis* is a variety especially worthy of note; it is a Japanese species, and very nearly hardy. The flowers are small, red and white striped, but produced in immense numbers. This species is being used largely in England for forcing. It suffers in comparison with a well-grown plant of tenderer, larger-flowered kinds, but its hardiness makes it much easier to handle, for which reason it is especially well suited for florists' use. A fine standard *Wistaria Sinensis*, Lilies and foliage-plants make grouping for the background, while in front there is a blaze of Pelargoniums such as one seldom sees. Among the best Zonal kinds are Clyde, vermillion-red; Fiery Cross, intense crimson; Belle Poitevine, salmon-pink, and the White Nemesis. Show Pelargoniums are in the majority. The collection contains some extra good varieties. Duchess of Albany is a fine dark-flowered sort; Duchess of Teck, large, white, faintly tinted pink, chaste and beautiful; Albino, white, with a light purple standard; Kingston Beauty, with a deep purple stand-

ard; Lizzie Cannell, the handsomest of all dark ones, with edges white and crimped; Madame Thibaut, another crimped kind, delicately blotched and penciled with rose and white, with crimped petals, and the handsomest of its color; Beacon, one of the showiest—its standard petals are very deeply blotched; Ophelia, a rosy purple, and very distinct, the most striking one of the group. The old Pelargonium Rollissoni must have a word. It is a distinct-looking species, with crimped, woolly and odorous foliage and a multitude of handsome umbellate corymbs of small rosy purple flowers. Show Pelargoniums, when out of bloom, should be ripened well by withholding water to some extent. In autumn Mr. Harris stores his plants in a cool light place where they are kept dry. In midwinter they should be pruned into shape, potted and started into a slow but substantial growth for spring-flowering. The same plants may be submitted to this treatment for several years.

Wellesley, Mass.

T. D. Hatfield.

Lewisia rediviva.

To the Editor of GARDEN AND FOREST:

Sir,—I have just returned from a visit to the experiment station near Paso Robles, where I was interested at finding a small colony of the beautiful Lewisia rediviva. It grows on the high valley land or rolling plain, about two miles east of the Salinas River, at an elevation of eight or nine hundred feet above the sea. The soil is a hard clay and rather sterile, and the plant has not been seen anywhere else in that region. I am not aware that the Lewisia has before been reported south of Monte Diablo in the valleys of California, but I may be mistaken in this, as I am not familiar with its literature, and, indeed, took the plant to Professor Greene for identification. It interested the Botanical Department of the University exceedingly, as it is really a plant belonging to the mountains and to colder districts. Professor Brewer found it on the summit of Monte Diablo, and it extends northward to British Columbia, and east to Montana, Utah and Arizona.

A number of people in Paso Robles who are fond of gardening have moved some hundreds of Lewisia-plants, while in full bloom, and set them out to form edgings. The Lewisia maintains its reputation of being exceedingly tenacious of life, and the large fusiform roots have gone on growing under a hot sun without seeming to suffer in any manner. I saw plants which bore twelve or fifteen large pale pink flowers apiece, and they form a very attractive border at this season. The small colony alluded to is already decimated for the use of such gardens, but the plant grows readily from seed, and is so hardy a perennial that the settlement, though only a few hundred feet across, will hardly be destroyed.

Charles H. Shinn.

Taxation for Municipal Improvements.

To the Editor of GARDEN AND FOREST:

Sir,—Your editorial of April 10th, on the proposed new system of parks for Essex County, alludes to a method of paying for such improvements which deserves more attention and stricter observance. You say "the valuations of property facing the new parks and parkways will be sure to advance sufficiently to more than pay for the improvement." Of course they will, and little reflection is needed to show that here is the natural fund which ought to be taken for every such improvement. That it is ample the history of all improvement abundantly testifies. But is it so taken? Consider what valuation increases with improvements of this kind. If I own a plot of unimproved property facing the park, valued at, say, \$5,000, and my neighbor has a similar plot with \$5,000 worth of improvements on it, it is manifest that, while he will have twice the amount of taxes to pay that I have, his property has increased no more in value than mine. His dwelling, fences, drains, etc., are not one whit more valuable because of the proximity of the park, but they are assessed as if they had an added value. Thus, even on the assumption that real estate is assessed at its true value, an inequality and injustice arises, which is added to by the fact that unimproved real estate is notoriously undervalued for purposes of taxation. Does not this go to show that in levying taxes for public parks and other such desirable improvements, the increased value of the land ought to be the basis of taxation, and improvements exempted? Any other system is, practically, a fine on the men who put their land to use. Your recommendations are in the line of sound public policy. You should go further and declare against a system of taxation which unduly burdens one class of property-owners for the benefit of another.

New York.

Luther G. Sand.

[So complicated a problem as the adjustment of taxes

for municipal improvements can hardly be settled offhand by looking at it from a single point of view. No doubt, the property which faces Central Park has increased in value since the park was planned by an amount equal to the original cost of the land condemned for the park. But, of course, these property-owners were not the only ones whose land was enhanced in value by the park. In the case of Essex County, the entire population voted for the parks. These will minister to the health and pleasure of all the people, and lands belonging to many of them will rise in value, even when it does not lie directly along the boundary of any new park. Almost every community has its own way of doing things, which depends partly on law, partly on precedent, and partly on tradition. A few years ago a wide parkway was built in a New Jersey city, which greatly increased the value of that portion of the city it traversed. All the land which was taken was valued by commissioners, and the owners of this land were paid what was considered its full value. In many cases, where a narrow margin was taken from a lot, it was naturally supposed that the remainder would be worth more when the road was built than the entire lot was originally; but the courts would not allow any deduction from the assessed damages to the land on account of this probable betterment, as it was held that no one knew how much the increased value would be, and it was unjust to tax values which only existed in the future.

As to the point of taxing the land only and not the improvements on the land, it may be said that in most cities where new streets are opened or sewers built taxes are levied by the front foot, without any regard to the value of the dwellings on the property. It may be worth while to note here that, in Baltimore, parks are paid for by taxing the gross receipts of street railways. From an article in *The Municipality and County* it appears that the greater proportion of the cities in the United States do not assess adjacent or abutting property for park purposes. Boston has an odd system of assessing lands about parks within distances varying from two hundred to six hundred feet. In Brooklyn, Prospect Park was made a charge against twelve wards, which composed the old city. Kansas City has a system of submitting to a jury the determination of what assessments against property adjacent to parks are equitable. St. Paul assesses sixty per cent. against adjacent property, the distances from the parks wherein such assessments are made depending on circumstances. In Denver there is an attempt to divide the city into park districts, each one of which shall be assessed for its own public grounds. Altogether, it looks improbable that any uniform system of levying taxes for park improvements can be expected in this country—for some time, at least.—ED.]

Recent Publications.

How to Know the Wild Flowers. By Mrs. William Starr Dana. Illustrated by Marion Satterlee. Revised and enlarged edition. Charles Scribner & Sons.

The popularity of Mrs. Dana's book is proved by the fact that the demand for it has justified an edition which contains fifty per cent. more plates than the old one, so that in this volume a hundred and sixty-four of our wild flowers are figured, and new descriptions of flowers have been added until nearly five hundred flowers are now described. Of course, the disadvantages of a book like this for reference are evident. When a comparatively small number of flowers are selected for identification, among the great number of those omitted there are sure to be many about which the learner will find himself hungry for information. Plants so common as to be generally recognized, very rare plants and those with inconspicuous flowers, are among the classes that are rejected, but all these phrases are comparative. The well-known flowers of one locality may not be familiar in another, and the novice is quite likely at the outset to come upon a flower that has

been omitted as rare, although, of course, he cannot know this. In completeness the book is much inferior to such a manual as Gray's *Field, Forest and Garden Botany*, which includes all the ordinary cultivated plants as well as most of our native ones. If Mrs. Dana's book has any advantage over an ordinary manual of botany in enabling readers to identify wild flowers, this comes from the fact that in it the flowers are classified according to their colors; that is, rather more than a hundred pages are given to plants with white flowers, then seventy-five to those with yellow flowers, sixty to pink flowers, twenty to red flowers, sixty to blue and purple flowers and about a score more to flowers which are classified as miscellaneous. The flowers are arranged something in the order of their opening; that is, the earliest ones of each color are described first. Thus, when the student comes across a red flower in mid-summer he has only to look in the list of that color among the flowers that bloom at that season, and if he finds the picture of it and the description he is made happy; if he misses them he wishes for better luck next time. One would hardly expect to make any great advance in knowledge by following this go-as-you-please plan, but we are assured that many people have carried this book into the country for a summer and have really discovered the names of a good many plants. Let us hope that many of these may be stimulated into something like a systematic observation of the vegetable life about them. If the book helps in any degree to encourage habits of observation, or if it leads to an unaffected admiration for the beauty of flowers and shrubs and trees it will be worth many times what it costs to any reader.

China Aster. Bulletin 90: Horticultural Department of Cornell University Experiment Station.

This compact little monograph is something of a novelty in the way of information from one of our agricultural experiment stations. In some prefatory remarks Professor Bailey discourages the habit of setting formal flower-beds in the midst of a lawn, because the flowers destroy the freedom and breadth of the lawn by cutting it into patches and by introducing brilliant colors and an appearance of activity and fidget where everything should be subdued, quiet and reposed. At the same time a broad stretch of greensward about the bed is the worst possible setting if the flowers are to be seen to the best advantage. Professor Bailey advises having flowers in lavish supply, but in small places he would plant them as borders along a rear walk or against a building. He might have added that there were certain perennials, and even annuals, that can be sparingly planted among the shrubs that border a lawn, although a long, highly colored edging of flowers as the boundary of a lawn may do almost as much to disquiet it as a mass of Coleus set well within it. He might have added, too, that in large places flowers never look more beautiful than when hedged within some formal enclosure where the gardener can gratify his taste for geometry and have the great bulk of his flowering annuals and perennials massed, not only so that they can be more conveniently cared for, but so that they can be arranged to produce brilliant effects without distracting attention from scenery of a more placid character.

On account of their easy culture, freedom of bloom and variety of form and color, these China Aster are among the very best of annuals for popular use, and they have the advantage of being at their best in the late season when the greater part of the perennials are spent and they carry a profusion of bloom until winter sets in.

After a brief history of the evolution of the China Aster from the species *Callistephus hortensis*, or, as Professor Bailey prefers to call it, *Callistemma hortense*, the different classes are described with considerable detail. No effort at an exhaustive classification is attempted, for this is plainly impracticable. Vilmorin divides the varieties into the pyramidal growers and the non-pyramidal, but Professor Bailey suggests as a serviceable scheme a separation into two sections: those in which the florets are open or flat, and those in all but two or three of the outer rows of florets are tubular or quilled.

THE FLAT-RAYED SECTION.—This section may be divided into two classes: (1) Those with ball-shaped flowers, and (2) those with flat or recurved flowers. In the first class are included Truffaut's Paeony-flowered Asters, one of the oldest and best

of the types, moderately tall and vigorous plants, somewhat pyramidal in habit, with small globular and nodding flowers in many colors. La Superbe is one of the best strains of this type. Semple's strain also belongs to the Globe class, so does the Jewell, a strain of rather dwarfer habit than the Semple and flowers less incurved than the Truffaut strain, with short petals and compact symmetrical heads. Triumph is another dwarf Globe-flowered Aster, but it does not seem to have been well fixed in habit as some of the flowers are Chrysanthemum-shaped.

The second or reflexed class of this section includes the so-called Chrysanthemum-flowered strain, the plants having various habits and various merits, and very useful in many colors. The Washington Aster is an offshoot from this strain, and so is the more refined Mignon, with plants of medium height, flowers more regular in shape than the Victorias, which are free-blooming and both tall and dwarf. The Emperor, in various colors, is a tall-growing, late-flowering strain; the plants branch sparingly and carry from three to five large Chrysanthemum-shaped flowers. Queen of the Market, and the varieties of this type called Queen of Spring and Queen of the Earliest, will bloom in August when the seed is sown out-of-doors. They have a free, spreading habit, with long stems, which makes them useful for cutting. The Candelabra group is somewhat like this, but later. The Crown or Cocardeau strain is medium or semi-dwarf, flowering early and abundantly. The centre of the flower is white, surrounded by a fringe of various-colored rays, and the central florets are somewhat tubular, so as to suggest the quilled section, with which they are connected. The Comet is, perhaps, the best of this class, if not the best of all China Asters, with its loose open flowers and long strap-shaped rays. Its color was not quite satisfactory at first, since the pink-tinted florets faded out into a dingy white, but the rose-colored and blue-flowered kinds, which appeared later, were improvements, and the clear white one introduced in 1892 by Vilmorin is altogether satisfactory. Occasionally these Comet Asters sport into an inferior form with a loose border and an open centre. They are not so useful for cut flowers as some of the larger-stemmed and rounder-flowered types. Finally, there is the Imbricated type, sometimes known as Imbricated Pompon, which is intermediate between the flat-rayed and quilled section. The rays are approximately alike, short and rather concave, springing from a tubular base. The heads are medium or small in size, but close and uniform in shape. The plants are sometimes dwarf and sometimes tall, but the habit is always compact, and it is a distinct and desirable strain.

THE TUBULAR OR QUILLED SECTION.—This section is divided into (1) the Button-quilled and (2) the Long-quilled or Needle Asters. The first division, with inner florets short and outer ones longer and flat, is represented by the German quilled in many colors, sometimes with drooping flowers, but mostly with tall and branching growth on long stiff stems. Dwarf Bouquet also comes in many colors. This strain grows only six or eight inches high, with a terminal cluster of small dense heads, with the centre florets short and tubular and a thin fringe of flattish rays. These are good for borders for formal effects. Shakespeare is much like them, but the flowers are most distinctly quilled. The second division of this section, with all the florets elongated and quilled, is represented by the Victoria Needle type, which has no rays whatever, but all the range and brilliancy of coloring of the Victoria type and long quill-like florets. Lilliput is a late and pretty strain in many colors, with small flowers and slender compact quills and tall plants.

The bulletin concludes with a list of 250 varieties offered by American seedsmen this year, the trade names being given without any attempt to determine the synonyms. Very few cultural directions are given, because few are needed. Seeds can be sown indoors or in a frame as early as the middle of April in this latitude if plants are to be grown in pots as specimens for exhibition, but where they are to be grown in borders it is quite as well to sow the seed where the plants are to grow. Last year the seeds of fifty varieties were sown at the Cornell gardens on the 4th of June, in which, notwithstanding the prolonged drought, every variety gave a profuse bloom throughout September and October. Few insects prey upon these plants. Their most serious difficulty is the rust which attacks the underside of the leaf and raises an orange-colored pustule. Timely spraying with ammoniacal carbonate of copper will keep this disease in check. A nozzle should be used which can throw the spray upward so as to strike the underside of the leaf. The first application should be made before the fungus appears, and it should be repeated every week or ten days.

Notes.

Some of the florists' windows are now decorated with sprays of Purple Beech and Laburnum. The dark wine color and soft texture of the young Beech-leaves, the light green of the trifoliate leaves of the Laburnum, and the rich pure yellow of its long pendent racemes make a very pleasing combination.

A male plant of *Nepenthes bicalcarata* is now in flower at the Botanic Garden in Washington. In *The Gardeners' Chronicle*, last year, it was reported that the same thing had happened somewhere in England, and the flowers were arranged in the form of an umbel. The specimen in Washington shows a fascinated growth at the base of the spike, the remaining part being similar to the inflorescence of other *Nepenthes*.

A Washington correspondent writes of a specimen of *Acer insigne*, on a grassy slope facing to the west; it is thirty years old, only twenty feet high, and is a beautiful small tree with large handsome palmate leaves, which, during even the hottest summers, preserve their green color, owing, perhaps, to their leathery texture. This tree is a native of Persia, and commends itself to those who are looking for lawn-trees which will not attain a large size very quickly.

The rooms of the New York Flower Mission, at 104 East Twentieth Street, were opened last Thursday for the reception of flowers, fruit and delicacies for the sick. Fresh flowers with long stems, and carefully packed for transportation, may be sent on Mondays and Thursdays throughout the summer season. Packages not exceeding twenty pounds' weight are carried free of charge by the express companies, as we have explained in former years when noticing this interesting charity.

In a late report made to the Minnesota Horticultural Society, Mr. R. Knapheide, of St. Paul, recommended that the game wardens of the state be empowered to protect wild fruits, which he declares are in quite as great danger of extinction there as the wild game is. He stated that in order to secure grapes, for example, reckless pickers cut the vines off and tore down the entire plant, so that if the practice continues many kinds of wild grapes and other fruits will be totally annihilated in a few years.

Professor Foster, the well-known authority on Irises, has raised a hybrid from seed out of *I. paradoxa*, fertilized by I. Korolkowi, the seed parent belonging to the *Oncocyclus* section, and the pollen parent to the *Regelia* section. The flowers are described as very beautiful in *The Gardeners' Chronicle*, the prevailing tint of the falls being a rich brownish purple, almost black, with purple veins on a translucent pale violet ground, while the standards are thinner, with radiating veins on a violet ground, and, altogether, it seems to be an interesting addition to the class of bearded Irises.

Large plants of tender and crisp-looking Romaine lettuce, started under glass and grown out-of-doors on Long Island, now sell for ten cents each. Mushrooms, which cost \$1.50 a pound during the recent period of cold weather, when their growth was checked, are quite plentiful since the warm days of last week, and bring seventy-five cents a pound. Florida tomatoes cost thirty cents a pound, and the more solid product of greenhouses, fifty cents. Of southern vegetables alone very nearly 100,000 packages were unloaded on the railroad and steamship docks of Jersey City and New York during last week.

The current number of *The Garden* contains a colored plate of *Acidanthera bicolor*, an Abyssinian plant of the Iris family, which ought to be more generally known. As long ago as 1888 we published a figure of this plant by Mr. Faxon, a reproduction of a photograph, showing its appearance when several of the bulbs were planted and grown in a tub, and some interesting details as to its cultivation by Mr. Endicott. The plant is nearly allied to *Gladiolus*, and can be treated like tender species of that genus, although it likes a stiffer soil. The plants that were grown in a tub flowered in October after frost had destroyed the out-of-door garden, and at this season their fragrant and pendulous flowers of creamy white, with chocolate-brown blotches, are very effective for decorating conservatories and living-rooms. When the bulbs are planted early the plants will flower in a border in late summer, but the flowering-time can be easily retarded by planting the bulbs late.

Mr. George H. Englehart, well known as an expert in raising Narcissi, writes to *The Gardeners' Chronicle* that the plant known as *Narcissus triandrus pulchellus* is really a natural hybrid between *N. triandrus* and *N. jonquilla*. The flower of this plant appeared to Mr. Englehart to have a perceptible Jonquil scent and it was sterile, and from this and other reasons he

inferred that it was a hybrid, and, therefore, some ten years ago he began to fertilize *N. triandrus* with pollen from the Jonquil. The seedlings, however, all died before flowering, until this year some have bloomed, and the artificially bred flowers seem to have all the characters of *N. triandrus pulchellus*, with the corona whiter than the perianth and the true Jonquil scent; the leaf-character and all the other features of the variety *pulchellus* are also present. Mr. Baker, in commenting on this specimen, seems to endorse the view of Mr. Englehart, that the plant we have known as a variety of *N. triandrus* is probably a hybrid between that plant and some of the Spanish or Portuguese forms of *N. jonquilla*.

Experiments on a considerable scale were made last year in Orange County, Florida, in cultivating Castor-beans as a commercial crop. The planting was deferred until May, so that the plants had only begun to ripen seed in quantity when the frost came and destroyed them. About 350 bushels of beans were gathered in two cuttings, and the experimenter has reason to believe that if he had planted in February a longer season and greater growth would have given a thousand bushels more before the cold killed the plants, since there were from three to five heads on each stalk which were too green to be of any value when the frost came. Of course, last season was specially unfavorable, and for ten years past Castor-oil plants have lived through the winter and begun to form new heads and ripen seeds early in spring, and it is thought that in the so-called Orange belt plants will go through the winter, as a rule, and bear seed for ten or twelve months. It often occurs that plants live five or six winters, and become real trees before there is frost enough to kill them. The experimenter does not seem to be disheartened, and the tract has been replanted with beans for this year.

Nearly 50,000 crates of strawberries reached this city during last week from North Carolina, the eastern shore of Virginia, Maryland and Delaware. The heaviest supply came on Wednesday, and 15,500 crates were put on the market. Until the latter part of the week, when heavy rains caused the berries to come wet and sandy, they arrived firm and well ripened, though large berries of choice or extra quality have been scarce. Prices at retail range from ten to thirty cents a quart box. The first blackberries of the season seen here, from Georgia, are small and seedy and sell for fifteen cents a quart, and green gooseberries, from Maryland, bring the same moderate price. The only pears now found in the markets are P. Barrys, from California. This variety is successfully carried over in cold storage until nearly midsummer. They are now at their best, the white juicy flesh having a sweet, slightly vinous flavor; they cost \$1.25 to \$1.50 a dozen. Newtown Pippins, the last of the season, cost fifty to seventy-five cents a dozen, and the same price is asked for the few remaining Northern Spies, while Roxbury and Golden Russets bring thirty to fifty cents, and the few choice Baldwins command fancy prices. New California apricots, in five-pound boxes, not fully mature and far from luscious, bring \$1.75, and Black Tartarian cherries cost twenty-five to forty cents a pound. Florida garden-grown pineapples of the largest size, from the keys, bring \$1.50 each. Jamaica limes, small and green, in which state they are preferred for use in fancy drinks, are offered at twenty-five cents a dozen. The sales of fresh tamarinds, from the West Indies, have greatly increased this year. Besides the general cooling qualities for which the pulp covering the seeds is popularly recommended, the fruit is credited with curative action in some forms of sore throat. Their grateful sourness is due to citric and other vegetable acids. Mangoes, from the same islands, sell at the rate of \$1.50 a dozen. Their aromatic fragrance when fully ripe is to most persons a higher recommendation than their stringy and rather insipid flesh, as we get them, but probably very little fruit of choice varieties ever reaches northern markets. The large supply of bananas, with the abundance of other fruits, has caused a drop in the extreme prices of a fortnight ago, and while a few red bananas of choice quality and large size bring seventy-five a dozen in the high-class fruit-stores, good yellow fruit costs only from fifteen to twenty-five cents a dozen. The last Almeria grapes sell for fifty cents a pound, and selected clusters of Black Hamburgs, from Rhode Island hot-houses, command from \$2.00 to \$3.00 a pound. Some idea of the immense quantity of fruit handled in New York city may be had from the wholesale auction sales of one day last week, when 25,000 boxes of lemons were bought by retail dealers, besides 15,500 boxes of Mediterranean oranges, 400 barrels of Jamaica oranges, four car-loads of California oranges, 55,500 bunches of bananas, 8,000 dozens of Bahama pineapples and 600 crates of the same fruit from Cuba.

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLES: —Street-trees.....	221
Small Parks for New York	222
Some Unusual Androgynous Flower-clusters. (With figure.)	223
Two Wild Vegetables of Merit.....	Professor F. W. Card. 223
FOREIGN CORRESPONDENCE: —London Letter.....	W. Watson. 224
PLANT NOTES: —Lilacs.....	224
CULTURAL DEPARTMENT: —The Russian Tree Fruits in America.—I.	T. H. Hoskins, M.D. 226
Pelargoniums. (With figure.)	W. N. Craig. 226
Miltonia vexillaria.....	E. O. Orpet. 227
Some Herbaceous Perennials	Robert Cameron. 228
CORRESPONDENCE: —Is Parsnip Poisonous?	Professor L. H. Pammel. 228
Agaves in Southern California	F. Franceschi. 228
At the South Orange Nurseries.....	J. N. Gerard. 228
MEETINGS OF SOCIETIES: —Meetings of the American and New Jersey Forestry Associations	229
NOTES	230
ILLUSTRATIONS: —Some Androgynous Flower-clusters, Fig. 33.....	231
Pelargonium, Amethyst, Fig. 34.....	227

Street-trees.

ONE can hardly think of a tree planted in the border of a city street without some feeling of pity. The air in which its leaves grow is polluted with dust and smoke, which impede their healthful action, and the soil in which it stands is often sterile, usually paved over, so as to prevent sufficient moisture from getting to its roots, and this aridity is intensified by sewers which hurry the water away as quickly as possible. In the majority of cases no attempt is made to protect it from horses which gnaw its bark, or insects which devour its foliage, and even if the tree survives these hardships it will be mutilated by telegraph linemen or amateur surgeons who will lop off its limbs, and thus invite the attacks of various fungi which will soon carry decay to its heart. Of course, the very hardships to which a street-tree is subjected ought to suggest the greatest care in selecting promising individuals of the species which have proved the most able to endure uncongenial surroundings, which means that only carefully grown nursery-trees of the best form and habit should be planted in the most approved manner in the richest soil that can be secured. But, in spite of all that has been written on the subject, we rarely find that the original work of selecting and planting has been done in a way that is anything like satisfactory.

These things have been said over and over again, so that we feel like making an apology to readers for once more repeating such elementary truths. But what we have seen within a few days past gives evidence that instructions can hardly be given too frequently or too fully. Through a neighboring city and its suburbs for a distance of more than a dozen miles a macadamized pleasure-drive has lately been constructed. Advertisements for proposals to plant the borders of this road with Maples or Poplars were made, and the contract was let to the lowest bidder, who agreed to furnish trees from ten to twelve feet high, to dig circular holes three feet in circumference and two and a half deep, to fill these holes with good loam and plant the trees properly in this fertile soil for eighty-five cents a tree. Of course, it is not possible to buy good trees and plant them properly for that sum. As a matter of history, the trees planted for the city were of the required height and trunk

diameter. A band of Italians dug holes of full contract dimensions, and then, in most cases, enough good soil to honestly fill them was dumped beside them. The trees were then distributed, one being laid by each hole, and it usually remained lying and drying in the sun for several hours, often for a whole day. These trees were mostly Cottonwoods and White Maple, both of which will endure a good deal of hard usage without dying outright. They were generally bare poles with two or three large prong-like roots a few inches long, and no small roots whatever. They were set up in the mold, and this was trodden firmly about them, but they were left without any stakes or guards. Where the holes were made in the hard pan the first heavy rain saturated the soil in the tight basin, and it became in many cases as soft as porridge, so that the slightest touch would tilt over the trees, and, although they have only been planted a month, a large per cent. of them lean more or less from the perpendicular. Most of them are dead at the top, and are putting out a few leaves along the trunk and larger branches. If the season is not too dry many of them will survive—that is, they will not die outright, but will linger out a sickly existence. Of course, there is no hope that any considerable portion of them will ever develop into noble and uniform specimens befitting the stately character of this avenue.

The utterly disreputable character of this work from the very beginning is emphasized by half a dozen trees along this same boulevard, where the owner of the land received permission to do his own planting. He made excavations six feet square and three feet deep, and filled them in with good soil in the early autumn, heaping up this soil to allow for its settling. After a winter of freezing and thawing, this soil had become firm and compact. Norway Maples, with well-formed heads, good roots and uniform size, were bought from a reputable nursery and properly planted the next spring. They were surrounded with a wire netting, and they have now passed through one trying summer and winter. This year they are making a vigorous growth, and stand as an object-lesson to show what the street might have been if intelligent care had been bestowed in making and carrying out the original contract. It is never worth while to plant street-trees at all unless they are planted in this way. The first essential quality of a good street-tree is the beauty of health and vigor. It is better to have no trees at all than to have those which are doomed to disease and premature death.

Of course, in formal planting like this only one variety should be used. The beauty of a country roadside is enhanced by the diversity of its growth, where constant change of form and color gives ever-renewed pleasure to the wayfarer. But when trees stand like a row of columns between parallel lines of buildings, the true formal and architectural effect can only be secured by continued repetition. It is this uniformity which makes an avenue of American Elms so effective. It is not the beauty of a single tree which causes this charm, but it is the multiplied effect of a thousand units which combine to make this a long colonnade supporting its Gothic roof. Of course, the American Elm is not the only tree which can be used to advantage, for in a different way an avenue of stately Tulip-trees may be quite as beautiful, while a row of Pin Oaks would have an effect distinctly their own, but unexcelled in grace. If all these trees were mingled together the effect would be dissipated and lost, as there would be no continuous line extending through the whole vista to give it unity of expression and consistency of purpose. This incongruity would be seen at once, and it would be exaggerated with each succeeding year, not only as the trees vary in rapidity of growth, but their peculiarities of form and size and expression would grow more striking and more contradictory every year.

The sum of the matter is that every city should plant its own trees as much as it should pave its own streets. The work, of course, should be superintended by experts, who, to do the best work, should have a municipal nursery, as

the commissioners have in Washington, who grow the trees which they plant, and can arrange to have them in suitable quantities and of the proper form and size at the time when they are needed. An expert commission would take care to plant the trees in a sufficient quantity of good, well-settled soil. They would set them far enough apart to give each tree an opportunity for its best development; they would water them and mulch them until firmly rooted; they would prune them properly and guard them carefully from all injury by man and beast, realizing that a healthy and vigorous tree is less liable to suffer from insects and disease than one which has been mutilated and enfeebled in any way. If we compare a street properly planted with another, along whose curb a row of spindling saplings from the woods have been carelessly set, we shall realize that the greater portion of the money which has been spent in planting street trees in this country has been worse than wasted.

AMONG the new tenement-house laws for this city, recently passed at Albany as a consequence of the work of the Tenement-house Investigating Committee, of which Mr. R. W. Gilder was the chairman, none are more important than those which relate to the speedy establishment of small parks in the most crowded districts of New York. One bill decrees that the Mulberry Bend Park, the East River Extension, and St. John's Cemetery Park, the formation of which was determined upon some years ago, shall at once be carried to completion. Another bill provides for the expenditure of \$3,000,000 for new small parks in the East Side district lying south of Fourth Street and east of Catherine Street and the Bowery—the most densely populated region in the known world, and at present wholly devoid of open areas or green leaves. A part of each park here established must be finished as a playground; and the law permits school-houses with playgrounds, as well as public baths, to be erected within the opened areas. A third bill provides that "hereafter no school-house shall be constructed in New York without an open-air playground attached to or used in connection with the same." Consequentially, the Board of Education, in purchasing grounds for new schools, has begun to buy additional strips of land for playground purposes, while the Board of Education, the Health Board and the Park Commissioners are already in consultation in regard to the best sites for the East Side parks.

These laws show a wholesome advance in public sentiment, and they indicate that the people who direct the thought and action of the city have come to believe that public parks are quite as essential to the health and comfort and morals of the city as a pure water-supply or a good system of sewage, and that a civilized community can no more flourish without them than without hospitals, libraries, museums, colleges and churches.

Some Unusual Androgynous Flower-clusters.

IN the last volume of GARDEN AND FOREST some notice was taken of the occasional monoecious or polygamous character of the flowering of Poplars and Willows. Androgyny, or the occurrence of both staminate or pistillate flowers together on the same spike, when normally they are separate, is much more common among Willows than is generally supposed, and there are numerous references to it in botanical literature dating back very many years.

It may be worth while to record several observations of variations from the normal habit of flowering among several other kinds of trees. Records of such cases are by no means new, and some occurrences of this nature are given in Dr. Maxwell T. Masters' celebrated work, *Vegetable Teratology*, published by the Ray Society, of London, in 1869. Among monoecious plants it is a common thing to find young trees bearing only male or female flowers, but both kinds of flowers are generally produced as the trees grow older. Abnormal development of the flowers is undoubtedly sometimes brought about by peculiar and unusual

conditions in the situation and surroundings of the plant or in circumstances which affect some portion of it. Often, however, no cause is apparent for any unusual development in blossoming.

PINUS HETEROPHYLLA (CUBENSIS).—The Pines are monoecious, the clusters of pollen-bearing flowers being commonly produced at the end of the growths of the previous season or about the bases of the new shoots, while the pistillate flowers or young cones are usually borne at or near the extremities of the young growths of the season on the longer more vigorous branches and higher up on the tree. Dr. J. H. Mellichamp, a careful observer, at Bluffton, South Carolina, has found large numbers of androgynous flowers on *Pinus heterophylla*. The male flowers or catkins are ordinarily from an inch to an inch and a half in length when fully developed, and the female flowers or cones are from about three-eighths to half an inch long when in condition for fertilization. In the androgynous specimens male catkins or flowers of normal proportions bear on their tips well-developed female flowers or cones of about the ordinary size. There is a marked constriction at the point of connection. In the phyllotaxy or arrangement of the scales, and in every other feature, the flowers of each kind appear perfectly normal. The female flowers probably become properly fertilized, but they wither and dry off with the male portion, and none have been known to develop into mature cones. Regarding this peculiarity in *P. heterophylla*, Dr. Mellichamp writes: "I first noticed this peculiar condition in February, 1893, again in 1894, and now again in 1895, all on the same tree. The tree is a small one, but of good girth, growing on an exposed point of land on May River. It is about twenty-five or thirty feet high, and has been exposed to fire and the submerging of the surrounding land by salt-water in the last great storms, but this was after I first noticed the bisexual flowers in 1893. The tree stands alone, and seems quite vigorous. The abnormal flowers are found chiefly on the lower and middle branches in the proportion of, perhaps, one-tenth of the abnormal to the normal flowers." Since writing the foregoing, Dr. Mellichamp has sent word that he has found another tree of *P. heterophylla* bearing androgynous flowers, this tree being larger than the one first noticed. Since this note of androgynous flowers on *Pinus Cubensis* was written, we have received from Dr. H. Christ a notice of the same thing, based upon Dr. Mellichamp's observations and specimens. It was published by Dr. Christ in *Le Bulletin de la Société Royale de Botanique de Belgique*, xxxiii., deuxième partie, pp. 88-92.

PICEA CANADENSIS (ALBA).—During several seasons two White Spruce-trees, growing on rather poor gravelly soil, have been observed to bear a number of androgynous flowers among innumerable normal ones of both kinds. These androgynous flowers are about of the normal size, and the apical portions of the spikes are occupied by the female flowers or little cones, while the male organs are on the lower or basal ends. In some specimens the male flowers take up fully two-thirds, or even three-fourths, of the spike, leaving only a short few-scaled female flower at the tip; in other specimens the length of the catkin is divided pretty evenly between the two sexes. There is no noticeable constriction or dividing line where the two sexes adjoin. In a flower collected from a third tree this season the male scales extend up among the female scales much more on one side than the other, and the two kinds of scales appear spirally continuous. None of these androgynous flowers have been known to develop mature cones. Somewhat similar cases have been recorded by other observers as noticed on *Picea Canadensis*, *P. excelsa* and *Larix larcina* (under the synonym of *L. microcarpa*), and are referred to in Dr. Masters' work already mentioned. On the trees under notice the androgynous flowers are borne on low branches within easy reach, and these branches are somewhat affected by the cone-like galls of chermes.

BETULA PAPYRIFERA.—Our Birches are monoecious, the male flowers, as partially developed catkins, being con-

spicuously exposed during the winter, the female aments being hidden within scaly buds, and only appearing with the renewal of growth in spring. In the Arnold Arboretum a Canoe Birch, *Betula papyrifera*, in its flowering season in the spring of 1894 produced a female ament two-thirds of the apical portion of which was covered by poorly developed anthers. No other ament was found similarly affected. Dr. Masters refers to androgynous catkins on *Alnus fruticosa* as observed by C. A. Meyer.

QUERCUS IMBRICARIA.—Our Oaks produce the male flowers in catkins from buds on the twigs of the previous season's growth, and the female flowers in the axils of leaves on the new growths in spring. During the flowering season of 1894, Professor Sargent found *Quercus imbricaria* bearing apparently fairly well-developed female flowers among the staminate flowers on male catkins. Of course, these female flowers never developed farther, but fell with the male catkins when the latter had shed pollen and withered. These flowers were found in the Arboretum on a vigorous tree introduced from farther south, as the species is not indigenous in New England.

MORUS RUBRA.—The flowers of the Mulberries are produced in catkin-like spikes, the male and female usually described as in separate spikes, often on separate branch-

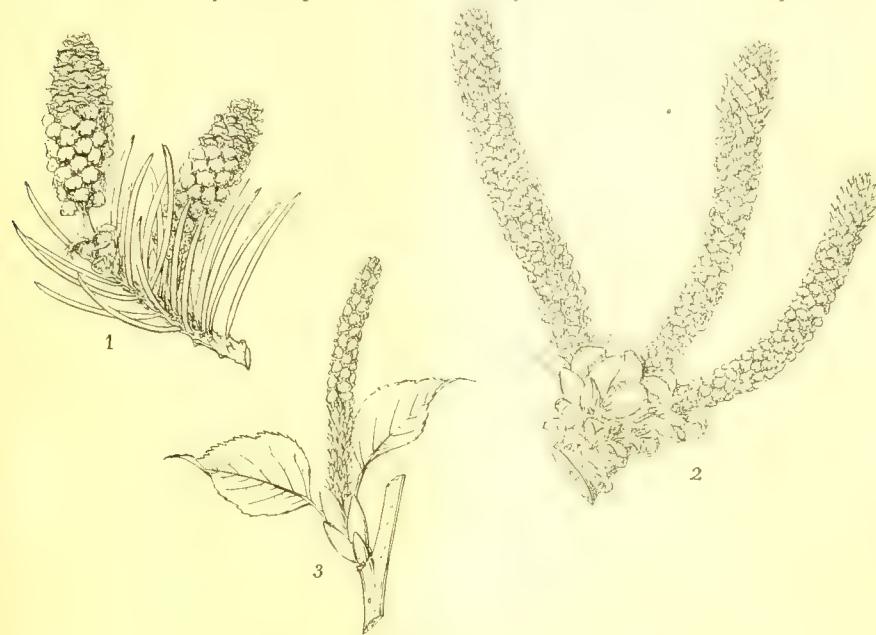


Fig. 33.—Some Androgynous Flower-clusters.

1. *Picea Canadensis*. 2. *Pinus heterophylla*. 3. *Betula papyrifera*.

lets or branches of the same tree, or on separate trees. It is not uncommon for both male and female flowers to appear on the same spike. This condition has been frequently noticed on the Red Mulberry growing in the Arboretum, also on the introduced *Morus alba* or White Mulberry. The flowers of both kinds seem well developed, but no observations have been made as to whether such spikes matured fruit, as they may when female flowers predominate.

The accompanying figures, from drawings by Mr. C. E. Faxon, represent androgynous flowers of *Pinus heterophylla*, from Dr. Mellichamp's specimens, of *Picea alba* and *Betula papyrifera*.

Arnold Arboretum.

J. G. Jack.

Two Wild Vegetables of Merit.

IT is a well-known fact that many of our fruits and vegetables have been developed from plants which in their wild state promised little. These wild products, compared with the results of centuries of cultivation, look so uninviting that we wonder that any attempt to improve them should ever have been made. Naturally, most of our esculent plants are of European origin. It may be true that the eastern hemisphere was favored with a greater variety of food-furnishing plants than the western; as

a matter of fact, however, the wild forms found there are in many instances positively inferior to those of the western continent. In many cases, it must be confessed, we are too far behind in the race to make it wise to neglect what our ancestors have gained, and begin with our wild plants where they began with theirs centuries ago.

Considerable attention has been and is still being given to some of the wild fruits of our country. In fact, we have only to look at the great Black Raspberry and Blackberry fields of New York or the Plum-orchards of the west to see illustrations of fruits which have been known to cultivation only within comparatively recent years.

Not much attention seems to have been given to the introduction and improvement of native vegetables, but there are undoubtedly species which are well worthy of trial in our gardens. One of these native plants, which is already gathered from the fields and used to a considerable extent in the west, is the Wild Lettuce or Lettuces, for, probably, more than one species is used indiscriminately. Both *Lactuca Canadensis* and *L. Ludoviciana* are common on the plains, but the latter is the more abundant about Lincoln. These are gathered and sold in the markets here in very considerable quantities in early spring-time, being chiefly used for greens. They fill an important place for this purpose, for they come in advance of Spinach, and when no other greens are offered in the markets. Whether these Lettuces possess advantages over the Dandelion in cultivation it is not yet possible to say. It seems quite likely, however, that they would better withstand the heat and drought of the summers on the plains. Whether they will take kindly to cultivation, how and when to sow the seed for best results, and other details, must all be learned by trial. It is not likely that either of these species can overtake the cultivated one as a salad-plant, but the leaves are very tender under favorable conditions, though they have a slightly bitter taste. They are sometimes used in combination with potato or other salads, and by some are preferred to ordinary lettuce. Should they withstand the winters in cultivation as well as they do in the wild state, they would have the advantage of being earlier than ordinary Lettuce grown outside.

Another plant apparently worthy of attention is the Ground Plum, or Buffalo Pea of the plains, *Astragalus crassifolius*. This is found abundantly in the draws or low grounds of the unbroken prairie. The plant is a perennial, apparently perfectly hardy and very productive. The fruit resembles gooseberries in size and general appearance. It is borne in numerous clusters very early in the season. It was frequently used by the early settlers when traveling across the plains in wagons in early days, but seems to have largely passed out of use. This could hardly be otherwise, for it is only found in the unbroken prairie. When cooked like string-beans the fruit forms a very acceptable dish. It seems to combine something of the flavor of beans, peas, asparagus and salsify. None of these are very pronounced, however, and it fails in quality rather from a lack of flavor than from any strong or disagreeable taste of its own. Many of our common vegetables, however, have not much in themselves to commend them, and their quality comes rather from the flavor imparted by substances added in their preparation. The fruit requires less time to cook than string-beans, and longer than green peas. If allowed to grow too large the pods soon become tough, and the season, at best, is probably a short one, though it might, through cultivation, reach a larger size before becoming tough. The chief point which recommends the plant for cultivation is the time at which the fruits are

ready for use. Some of the crop from which these opinions are formed was ready to be gathered on May 7th. Even then a few of the fruits were too large to be at their best, although this was far in advance of the season for beans or peas. In fact, the only vegetable which would at all interfere with it is asparagus. This can hardly be an objection, however, for there would certainly be room for two such vegetables at the same season, especially as they are so different in general character.

Experiment Station, Lincoln, Neb.

F. W. Card.

Foreign Correspondence.

London Letter.

CULTIVATED FERNS.—A list of all the Ferns cultivated in the Royal Gardens, Kew, has just been issued, and may be obtained at the Gardens, price sixpence. It contains the names and synonymies in use in gardens of 1,116 species and well-marked varieties of Ferns and ninety-seven of Fern allies (*Lycopodium*, *Selaginella*, etc.); it also contains, in the form of an appendix, a list of nearly six hundred cultivated and feral varieties of British Ferns, the Kew collection of these being exceptionally rich. There is no collection of tropical and temperate Ferns equal in extent to that at Kew, where they have been a prominent feature for at least fifty years. The history of the collection is told in an introduction to the list, which will have a special value for cultivators of Ferns, than which no natural order has a more complicated and irritating nomenclature. The arrangement of the names in the Kew list is alphabetical, and the classification followed is that of Hooker and Baker's *Synopsis Filicum*, the only standard work on the order.

Authorities and countries are given in each case, so that the list will have a value for botanists as well as for cultivators. It is earnestly hoped that the nomenclature of this and similar lists of garden plants, now being prepared with considerable care and pains at Kew, will be adopted by cultivators, at any rate, so that we may all have something like uniformity in regard to the names of cultivated plants. Lists of the Hardy, Herbaceous and Alpine Plants, and of the Orchids, are now in course of preparation, and will shortly be published, the intention being to have in time a complete catalogue of the whole of the vast collection of living plants at Kew, a rough census of which gives the total number as, approximately, 20,000 distinct species and varieties. Of course, the price of these lists is merely nominal, certainly not more than covers the cost of printing and paper, the object of the authorities being to place at the disposal of all interested a reliable standard of nomenclature for garden plants.

THE KEW MUSEUMS.—The contents of the museums of Economic Botany in the Royal Gardens, Kew, are exceptionally rich in plant products of all kinds, their object being "to teach us to appreciate the general relations of the vegetable world to man." There are three separate buildings, one for all Dicotyledonous Plants, another for Monocotyledons and Gymnosperms and the third for specimens of Timber and bulky specimens generally. Museums do not as a rule appeal to the laity, except as places in which to spend a pleasant afternoon, but the Kew Museums have a great attraction for business, especially commercial men, as well as for botanists and horticulturists. The official guide-books to these museums, of which there are three, one for each building, are valuable for the useful information they contain about all sorts of plants and their products. I call attention to them here because the guide to the Monocotyledons and Cryptogams has only lately been published and its contents are of more than ordinary interest. Palms, Scitamineæ, Amaryllids, Liliaceæ, Aroids, Bamboos and Grasses generally, besides, Ferns, Fungi, Mosses, etc., are treated upon, and information about their most noteworthy products is given. I quote the following as a sample paragraph from the hundred pages or so of this valuable little encyclopædia, the price of which, by the way, is fourpence:

"IVORY NUT PALM (*PHYTELEPHAS MACROCARPA*).—A plant with a prostrate stem and leaves often 20 feet long, inhabiting the banks of rivers and rivulets in Central America and New Grenada. The fruits are borne in large globular heads, one of which is here shown attached to the stem. As the seeds ripen they become very hard, like ivory, and are, consequently, known as Vegetable Ivory, and are largely used for making coat-buttons, chessmen, and for various other useful and ornamental articles, as well as for artificial snowflakes in theatres." Samples of the stem and many kinds of articles manufactured from the seeds are shown in the cases.

CATTLEYA FLORIBUNDA.—Plants bearing this name are offered by L'Horticulture Internationale, Brussels, and M. Linden says it is "the most marvelous new Orchid of recent years." He describes it as a possible natural hybrid between *Cattleya maxima* and *C. labiata*, var., having large flowers borne on strong scapes, some scapes bearing as many as twenty-one flowers. Their color is "brilliant dark carmine for the most part," but there are white and other varieties known. The flowering season is from September to December, and as the plants were introduced into the Brussels Nursery on December 30th last, I presume none have yet flowered there, and therefore the description of the flowers has been made by the collector on the spot. *C. maxima*, one of the suggested parents, is a native of southern Peru and Ecuador; presumably, therefore, this region is the home of *C. floribunda*. There is evidence of a growing desire among orchidists to give a mongrel origin to as many new Orchids as possible, *C. floribunda* being a case in point.

CYPRIPEDIUM, GERTRUDE HOLLINGTON.—This is a gigantic flowered hybrid, of which a plant shown in flower last week by Messrs. H. Low & Co. received a first-class certificate. Its parents are *Cypripedium ciliolare* and *C. bellatulum*. It is exceptionally large and robust in foliage as well as in flower, the leaves being nearly three inches wide by seven inches in length, and the petals of the flower are fully one and a half inches wide, creamy white, with purple lines and dots; the dorsal sepal is large and broad, creamy white, with green and purple shading, and the lip is greenish white below, rose-purple above. It was generally admitted to be one of the largest and most striking of the hybrid Cypripediums. It was raised by Mr. Ayling, gardener to Mr. A. J. Hollington, and the raiser of several very handsome hybrids.

W. Watson.

London.

Plant Notes.

Lilacs.

THE past year has been one of the most severe ones which plants in the eastern United States have had to endure for a long time, and it serves to emphasize the good qualities of several shrubs which have not previously had to submit here to exceptionally trying climatic conditions. All the species of Lilac in our gardens are in perfect condition this year, the late-flowering *Syringa Japonica*, *S. Pekinensis*, *S. Amurensis* and *S. villosa* are covered with flower-buds as they have never been before, and the charge that has been made against *Syringa Japonica* and *S. Pekinensis* of being shy bloomers cannot be sustained. It is now apparent that these noble plants only require age to enable them to produce flowers in the greatest profusion. Of the early-blooming species of Lilac, *Syringa oblata* has produced more flowers this spring than it has for many years. It will be remembered that this northern China plant is the earliest of the Lilacs to flower; that its flowers, which are borne in short, broad, compact clusters, are pale purple or mauve color, and very fragrant; that the leaves are not attacked by the mold fungus, which whitens here in summer those of the common Lilac, and that in the autumn they turn to a most beautiful deep vinous-red color. A figure of a flower-cluster of this plant was published on page 221 of the first volume of GARDEN AND FOREST. This

shrub ought to be better known, and every one who has a northern garden should plant one of these Lilacs. The other comparatively rare and little-known early-flowering Lilac, *Syringa pubescens* (see GARDEN AND FOREST, vol. i., p. 415, and vol. vi., p. 266), has also bloomed this year as it has never bloomed before in American gardens, the slender stems being often bent to the ground under the weight of the flower-clusters. This species flowers with the Chinese and Persian Lilacs and with the latest of the varieties of the common Lilac, *Syringa vulgaris*. By some people this is considered the most beautiful of the whole race. The flower-clusters and the individual flowers are smaller than those of other Lilacs, but they excel them all in fragrance, and there is a grace and charm about this plant, which is also a native of northern China, to which none of its more robust relatives can lay claim.

The Lilac season, which twenty years ago lasted a week or ten days, can now be prolonged through six or eight weeks by means of the new introductions which have come to us through the agency of the Arnold Arboretum, and no good northern garden will be complete without representatives of all the species, to say nothing of the new varieties of the old-fashioned *Syringa vulgaris* which French and German gardeners are turning out every year, and which are plants of surprising beauty and the greatest value. The northern United States, of all parts of the world, is best suited to develop the greatest beauty of the deciduous-leaved trees and shrubs of northern countries, and among them all none are more at home or give greater satisfaction than the Lilacs.

The action of cold or of drought, followed by cold, on plants in certain years is not yet well understood. Correspondents in Boston write us, for example, that the common Barberry, which has become entirely naturalized in eastern New England, has suffered severely during the past winter, old-established plants in fields and gardens being often killed to the ground, while the Laburnum, which is always rather tender, and does not flower well in that latitude one year in five, is now everywhere covered with flower-buds. Native shrubs near Boston have generally suffered as much as exotics, and the dead branches which may be seen in the roadside shrubberies testify to a remarkable combination of circumstances adverse to plant-life.

CRATAEGUS PUNCTATA.—So many of our native Thorns are desirable trees that it is difficult to select any one of them for special commendation. There are, at least, half a dozen species which ought to be in every collection of any size, each of them having a character of its own, and an individual expression which is marked throughout the season. We select *Crataegus punctata*, sometimes known as the Dotted Thorn, because, as it was seen last week in Prospect Park, Brooklyn, it was, perhaps, the most interesting small tree there. Its widespread branches stand out mainly at right angles from the trunk so that the deep shadows between the different strata of foliage are generally horizontal, and the head of the tree is often flat-topped. Farther north in Canada these branches sometimes have a spread of forty feet and the trunks are more than three feet in circumference. The best trees in Prospect Park are twenty feet high and broader than they are tall, and just now the corymbs of white flowers borne on the upper side of the level branches give the tree a singularly beautiful effect. Of course, these flowers are abundant, but the clusters do not seem so dense as they are on some other species, nor are they quite as abundant, but the tree is all the more interesting than it would be if the proportion of white to green were greater. This tree is beautiful also in autumn, when its branches are covered with showy fruit, while the foliage turns to a bright orange and scarlet and adds to its attractiveness.

PRIMULA CORTUSOIDES SIEBOLDI.—At this time there is no hardy herbaceous plant that excels this Primrose in the brightness of its flowers. It grows vigorously, and with good treatment increases in size and produces an abun-

dance of flowers each year. It does best in a sheltered situation where it will be shaded from the sun during the hottest part of the day. Mr. Cameron, writing of this flower from the Cambridge Botanical Garden, says that it grows there in a strong, rich, loose loam of a rather damp nature. The flowers are produced on stems eight to twelve inches high, and a single flower measures almost two inches in diameter. The beauty of this plant is lost when only seen with one or two flower-stems. At Cambridge a large clump, measuring half a yard across and bearing fifty or sixty stout stems with large umbels of flowers, shows how effective it can be. It is a strictly herbaceous perennial; the coarsely toothed, ovate leaves die down in the fall and come up again in the spring. The flower is very variable, and a large number of forms have been raised since it was introduced from Japan thirty years ago. One named grandiflora is in flower now, and it is a magnificent plant. Although its habit is the same as that of the type, the flowers are quite distinct, being much brighter and slightly larger. In the fall this Primrose should be covered with dry leaves and a few pieces of board to keep them from being blown away. In spring, whenever there are signs of growth, the covering is removed.

STELLARIA HOLOSTEAE.—This is now the best white-flowered plant in the front row of the herbaceous border. When its flowering season is over it looks rather weedy, and it grows so freely that if not kept in subjection it very soon destroys the other low plants growing near it. Nevertheless, it is a good perennial and deserves a place in the choicest borders. The white, star-like flowers measure three-fourths of an inch in diameter and grow in cymes on the stems. The flowers are produced very plentifully and the plants are completely covered with white flowers. When massed together this plant is very effective, and Mr. Cameron suggests that it can be used for a spring bedding-plant when white flowers are scarce.

A NEW IRIS.—We have received from Mr. Gerard flowers of a new Iris, the production of Professor M. Forster, a cross between *I. paradoxa* and *I. variegata*. We are not aware that it has been named, but, according to Professor Forster's usual nomenclature, this would be *I. Parvar*. The plant is especially interesting as a cross between an *Oncocyclo* Iris and one of the ordinary bearded Irises, with a quite different habit. *I. paradoxa*, which is rare in cultivation, is one of the dwarfest of *Oncocyclo* Irises, with narrow rhizomes and quaint purple flowers with a very marked disproportion between the standards and the falls, even for this section, where the falls are always smaller than the standards. *I. variegata* is the common Iris with large rhizomes. The type has yellow standards and madder-brown or reddish brown falls. The new Iris has a rhizome—short, creeping and thick. The leaves are a foot long, falcate, light green and slightly glaucous. The stems are about a foot and a half tall, and bear two long, flat, oval scapes, the terminal being double-flowered, the lateral having a single one. The standards are only slightly larger than the falls, have beautifully crimped edges, and are of a rich vinous-purple, with a median vein of darker color and white linings on the inner base. The oblong falls, not much recurved, have a deep rich reddish brown lip, and are lined on the edges in the same color on a white ground. The beard is formed of fine hairs of a lighter hue. The fall is covered with very fine hairs, giving it an effect of velvet. The styles are light reddish brown. Altogether it is a flower of rich color and striking beauty. This has been grown by Mr. Gerard two years, and as it has proved to be of vigorous growth and perfect hardiness, it is a welcome addition to the garden. It is not a deciduous variety, and requires none of the special treatment in the way of dryness which the *Oncocyclo* Irises need.

HEUCHERA SANGUINEA.—This handsome plant of the Saxifrage family is now well known as one of the best small hardy plants introduced in recent years, and much testimony as to the esteem in which it is held has been published in GARDEN AND FOREST, especially since it has been

found to be reliably hardy. It is easily and rapidly increased by the crowns which it produces in abundance, and also by seeds. Growers of seedlings have been rewarded by the production of new forms differing in tone of color and size of flowers. One of the best of these forms, which has been extensively propagated, is known as Splendens. In this variety the color is very intense and the flowers about twice the size of the type. Nothing could be prettier than the arching stems of this plant bearing a row of gem-like flowers of beautiful color. To speak more exactly, it bears along arching stems, on the ends of short pedicels, clusters of three and more flowers, which are of a bright red of the tint known as cerise.

Cultural Department.

The Russian Tree Fruits in America.—I.

ONE who attempts to trace the origin of different varieties of orchard fruits will find the investigation difficult and wearisome. This is not surprising in the case of native fruits, which are usually known and valued for some time in a single neighborhood or town before attracting attention elsewhere. But in the case of imported kinds it would seem that there should be less difficulty. Yet our earliest New England authority, and it is a most excellent and painstaking work, Cole's *American Fruit Book*, credits the Duchess of Oldenburgh Apple to Russia, Red Astrachan to Sweden, and fails to notice either Tetofsky or White Astrachan. Yet it is generally supposed that they were all brought to this country from England at or about the same time. Mr. Cole was the editor of the *New England Farmer*, supposed to be the oldest agricultural newspaper in America; and the importation of these Apples is credited to the Mannings, of Reading, Massachusetts. Inquiry reveals the fact that there are in that town two families of that name, yet not related, and as, by correspondence, I find that one family declines the honor, I am left to the conclusion that the true source of this importation is the family now represented by Mr. J. W. Manning, from whom I received the Tetofsky in 1872. At about the same time I received the Duchess of Oldenburgh from Mr. S. L. Goodale, a prominent horticulturist of Saco, Maine, while the Red Astrachan was sent to me by the great nursery firm of Ellwanger & Barry, of Rochester, New York, at the same time, or a little earlier. This variety, notwithstanding its Russian origin, has not proved hardy against the cold winters of north-eastern Vermont, which is hardly surprising, when it is remembered that Astrachan is the southernmost province of Russia, with a climate, judging by its products, not unlike that of New Jersey. Some further correspondence with Massachusetts parties leads me to the conclusion that the above-named Russian Apples reached this country from English growers, who, in their turn, obtained them from Sweden, which was probably the reason for the assignment of the Red Astrachan to that country by Mr. Cole.

Of the above-named importations only three varieties, the Oldenburgh, Tetofsky and Red Astrachan, have had a wide distribution in America. It was soon discovered that the Oldenburgh and Tetofsky could be grown successfully much farther north than any other well-known sorts, and it was to these that the title of "Iron-clads" was applied; first, I think, in Minnesota, after one of the "test winters" of that region had cut off nearly every other sort of cultivated tree fruits.

At about the same time at which I became practically acquainted with this cold-resisting characteristic of these Russian Apples, disappointments in Wisconsin and Minnesota, resulting from the widespread destruction of many young orchards by severe winters, gave rise to a strong demand for a more thorough and extensive trial of the tree fruits of north-eastern Europe. Quite a number of Americans were at that time engaged in scientific and industrial service under the Russian Government, and through these a considerable importation was made on private account. Representations were also made to the national authorities; and after the expenditure of the usual amount of red tape, a large importation of Russian Apple-trees and cions was made, which on arrival were distributed from Washington. This distribution was made with so little judgment that more than half, perhaps as much as two-thirds, of the whole importation was lost. The cions which were sent direct to farmers were generally a total loss, as not one farmer in five hundred throughout the country has ever learned the simple art of grafting, which every farmer's boy should know by the time he is ten years old. But enough survived, and in time came to fruitage, to satisfy intelligent fruit-growers that here was a race of Apples quite

new to America, and capable of far greater resistance to cold than the fruits of western Europe, which constituted our sole stock at that time, with the few exceptions noted above.

Newport, Vt.

T. H. Hoskins.

Pelargoniums.

AT this season of the year no class of plants compares with Fancy Pelargoniums for decorative purposes in the greenhouse or conservatory. They are by far the most gorgeous of the Geraniaceæ, and no one having a greenhouse should be without them. They also make admirable window plants. For several years their cultivation has been much neglected in America, and even now, when they appear to be regaining some of their lost popularity, there is hardly a florist who catalogues more than two or three varieties, and these are usually not the best ones, so that the only way to secure a good selection is to import the plants. For market purposes, Pelargoniums have never been very popular, and it is surprising that they have not received more attention from florists. They are easily cultivated, and can be grown almost as cheaply as ordinary bedding Geraniums. Last year I persuaded a neighboring florist to grow a few dozens in five and six inch pots. The plants sold readily, and his customers were perfectly satisfied with their behavior as window or piazza plants. In England enormous quantities of Pelargoniums are grown for the large flower markets, usually in six-inch pots, and thousands of plants are sold each day in Covent Garden alone during the height of the season. Few cottagers in England or Scotland who grow window plants are without a Pelargonium. Owing to the cooler summer weather there, the plants do not bloom until September. In this country they are usually spent by July, but this gives two months of constant bloom, a much longer time than a Cineraria or Calceolaria lasts.

Cuttings inserted during September or October can be easily grown into nice specimens by the following May and flowered in six or eight inch pots. We place our cuttings in boxes of sand provided with ample drainage, and treat them in the same way as ordinary Geraniums. The plants should be grown in an airy house and kept well up to the light. Green aphis is their chief enemy, and to combat this we spread some tobacco stems among our plants and give a fumigation about once in ten days. The best time to give a thorough fumigation is just before the blooms start to open, as tobacco smoke causes most of the petals to drop.

Although young plants can be grown to sufficient size in one season for most purposes, older ones make fine specimens for a show-house. After the blooming period is over the plants can be stood outdoors and kept rather dry until the middle or end of August, when they may be pruned back. After pruning they should be watered freely at the root to encourage the plants to break, and when shoots an inch or more long have been made they can be shaken out and repotted into pots of the same size, or a size smaller than they were in before. The soil should be well shaken from the roots, and the roots themselves pruned back. The plants should not be exposed to cold rains or early frost. For compost we use two-thirds turf loam and one-third well-dried cow-manure. Some bone-dust may also be advantageously mixed in, and a shovelful of sharp sand to each bushel of compost. If extra large specimens are desired the shoots must be well staked out. In England specimen plants are often three to four feet across, and the shoots are tied down to a wire or wooden circular frame above the top of the pot. Magnificent specimens of Pelargoniums are shown yearly, especially at the York and Manchester shows. Such plants, though displaying marvelous cultural skill, have a rather formal appearance, and more naturally grown specimens are preferable.

Pelargoniums are gross feeders, and liquid-manure can be as freely used as with Chrysanthemums. During the blooming period they require plenty of water. We place a saucer under each pot. If a plant gets thoroughly dry at the root a loss of foliage follows, and its appearance is spoiled. While flowering the portion of the house where the Pelargoniums are kept should be well shaded and be as cool as possible.

Of late years great improvements have been made in this class of plants, especially in the new hybrid semi-double sorts. These usually have seven and eight petals each, and last much better than the single ones. Good varieties of Pelargoniums are Mrs. R. Sandiford, Volonté nationale alba and Princess Teck, among whites; of colored ones the following are good: Madame Thibaut, Kingston Beauty, Dr. Masters, Triomphe de St. Mandé and Volonte nationale.

W. N. Craig.

[Last year we saw some exceptionally well-grown Pelargoniums at the nurseries of Messrs. Turner, at Slough,

Taunton, Mass.

England, and also at one of the Regents Park exhibitions. At our request, Mr. Charles Turner sent photographs of several plants, one of which is reproduced on this page. This plant is not so completely covered with flowers as many of the others were, and for that reason it is rather more interesting, since the foliage which appears between the flowers gives them distinctness of outline, and helps them in every way by furnishing relief and contrast. The

do this plant much better than they can in England, and this is remarkable in that the standard works on Orchids seem to insist on an equable temperature the year through, and it is the more surprising that with our extremes we can succeed so well with a plant enveloped in mists and rain for the greater part of the day in its South American home. We have one advantage over transatlantic cultivators in the tobacco-stems that are so easily obtained for the purpose of keeping down thrips, a pest to which *Miltonia vexillaria* is specially subjected.



Fig. 34.—*Pelargonium, Amethyst*.—See page 226.

variety in the illustration is known as Amethyst, a very dwarf and floriferous sort. The top petals are deep maroon, beautifully edged, and the others are a rich purple.—Ed.]

Miltonia vexillaria.

THE picture of a fine variety of this plant in GARDEN AND FOREST for May 15th reminds me of the ease with which this Orchid may be cultivated in American gardens. I was told by a distinguished English visitor the other day that we

Our plants were infested when received, but a few dustings of tobacco in the axils of the leaves and tobacco-stems spread under and round the plants as they grew, soon cleared them of insects, and insured good, clean, healthy growth. This *Miltonia* is another of those Orchids that can be counted on to increase both in size and value each year. If carefully placed in the coolest house in the summer months, and at the cool end of the Cattleya house, where a temperature of fifty to fifty-five degrees can be obtained in winter, shaded from bright sunshine at all times, except in the depth of winter, they grow without difficulty.

After the flowering period the plants will need a little rest to recuperate, but water must not be withheld, and soon the young growths will start away, and this is the time to repot, which will be about September, when cool nights will insure a good start. For a potting compost we use moss and Fern-root, with a little dried cow-manure from the pasture. They seem to like this and manure-water at every second or third watering after the roots have begun to run through the potting material, but it should be applied well diluted.

There is no form of decoration to which these lovely flowers will not lend themselves, either as cut blooms or in the pots. The graceful, arching sprays of pink flower shades vary from a rich deep rose to the pure white of the unique "Fairy Queen," but even the common forms are beautiful enough for any garden. Many of our plants are producing four spikes from one bulb, and one of these single bulbs has forty-one flowers on the four spikes, so the free-flowering qualities of this *Miltonia* can hardly be overstated.

Another very fine *Miltonia* is *M. Roezlii*, and its white variety. The flowers of this plant are very fragrant and have the same outline as *M. vexillaria*, but it requires a warmer house than the latter, as it comes from a much lower elevation, from 1,000 to 2,000 feet, while *M. vexillaria* grows at an altitude varying from 4,000 to 7,000 feet above sea-level, so that it will easily be understood that a house at least ten degrees warmer in winter is necessary for *M. Roezlii*, otherwise it is of the same easy culture and flowers at the same time of year.

These two *Miltonias* used to be and are still known in catalogues as *Odontoglossums*, but of recent years they have been removed to the genus *Miltonia* with which they have a true affinity. Owing to the recent introduction of these plants there is a reasonable hope that other large-flowered forms of *M. vexillaria* will soon be obtainable.

South Lancaster, Mass.

E. O. Orpet.

Some Herbaceous Perennials.

POLEMONIUM REPTANS is a native plant that is giving good satisfaction this year, and every little stem is loaded with flowers. It is eight or ten inches high, and its drooping beautiful blue flowers are produced in loose panicles. The spreading stems are well clothed with pinnate leaves, and give the plant a neat and compact habit. It grows well in ordinary garden-soil, and likes a position where it is not shaded by trees.

The Rocky Mountain Columbine, *Aquilegia caerulea*, is one of the best in this genus. It is a choice perennial, and deserves more attention than some of our commoner forms. All the Columbines are graceful and beautiful, but this species is especially so. Its special beauty is in the nearly erect blue and white flowers. They are nearly three inches across, and the nearly straight, green-tipped spurs of the flower measure two inches in length. The plants grow to be twelve or fifteen inches high, and the leaves are large and binate. *A. caerulea* does well in the border or rockery. It is, however, not a long-lived plant; seed should, therefore, be sown annually, so that young plants may take the place of such as fail to come up in the spring.

On the north side of an *Arbor-vitæ* hedge a good strong plant of *Orchis latifolia* is now showing, as it has in successive springs, strong spikes of purple flowers. This plant does well in such a situation in deep rich moist soil. It does not like to be disturbed often, and when once established should not be moved for a number of years. It grows about fifteen inches high; its leaves are lanceolate, spotted with purplish black. The flowers of this English plant are produced in dense spikes, and they last for a considerable time.

Harvard Botanic Garden.

Robert Cameron.

Correspondence.

Is Parsnip Poisonous?

To the Editor of GARDEN AND FOREST:

Sir,—In your issue of May 1st Dr. Halsted has some interesting notes on poisonous plants. What Dr. Halsted says in regard to poisoning from Cowbane, *Cicuta maculata*, is to the point. The cases of poisoning from this plant are so frequent, not only in this state, but elsewhere, that I have prepared a paper on the subject, which will soon appear in our station bulletin. I have looked up with considerable care cases of poisoning, and I have yet to learn of a case of fatal poisoning from Parsnip running wild or "Wild Parsnip," *Pastinaca sativa*. I have requested specimens, and have asked to receive information of authentic cases, but they have not turned up. We have the best of evidence that the plant is not poi-

sonous. No one can question the evidence introduced by Professor Frederick B. Power,* whose careful scientific work along the lines of pharmacy is well known. Professor Power failed to find any poisonous substance in "Parsnips running wild"; boiled roots fed in considerable quantity to a cat showed no symptoms of poisoning. His associate, Dr. Cramers, insisted upon eating one-half of a raw parsnip which was sent to him from West Salem, Wisconsin, and which were supposed to cause the cases of poisoning in question, but no ill effects followed.

Again, Dr. Brown, of Sheboygan, Wisconsin, had prepared enough wild parsnips for a good dinner, which he ate, and, if I remember correctly, his whole family ate of it, but without any ill effects. Now, these Parsnips had been running wild for fifty years.

I have myself eaten raw parsnips "running wild," but could observe no injurious effects whatever. I have been trying in a limited way to demonstrate the non-poisonous properties of parsnip, and that people should especially guard against *Cicuta maculata*. I believe it is largely a myth that parsnip is poisonous. It is possible that some people may have peculiar idiosyncrasies for parsnip just as for celery, but to call the plant poisonous is a mistake.

Agricul'tl College, Ames, Iowa.

L. H. Pammel.

Agaves in Southern California.

To the Editor of GARDEN AND FOREST:

Sir,—In reference to the beautiful engraving of *Agave Huachucensis*, in your issue for May 8th, allow me to say that *A. applanata* has frequently bloomed during late years in southern Europe, and, as far as leaves and habit are concerned, it appears to be totally different from the subject of your picture. *A. applanata* is a larger plant, with a smaller number of leaves, which are nearly triangular in shape, of an ashy gray or whitish color, with strong decurrent dark red mucros and similar spines. Two-year-old plants of *A. Palmeri*, from seed received from the Missouri Botanic Garden, are certainly not to be confused either with *A. applanata* or with grown-up specimens of *A. Parryi*, received from the same source, and from Professor Tourney, of Tucson, Arizona, who writes that in his opinion *A. Parryi* and *A. Huachucensis* have been badly mixed together.

Every one who takes interest in the progress of botany and of practical horticulture in the United States will concur in your view that a large number of plants can be thoroughly studied only if grown in the open and in conditions similar to those of their natural homes. Such a station as suggested, or better still, something like an Arnold or a Shaw endowment, we ought to have in southern California, a location which offers so many advantages to growing in the open all sorts of plants from many climates. Meanwhile we are working steadily here to increase the nucleus of such a garden. Of the above-mentioned plants we have already of *Agave* thirty species; *Fourcroya* and *Beschorneria*, eleven species; *Dasyllion*, *Beaucarnea* and *Nolina*, seventeen; *Yucca*, fifteen; and among them such rare ones as *Agave angustissima* and *A. parviflora* (illustrated in GARDEN AND FOREST), *A. vestita*, from Guadalajara, *A. Margaritae*, from Lower California, *A. Franzosini* and *A. Henriquesii*, recently described by Baker; *Nolina Beldingi*, from the extreme southern point of the Peninsula of California; *Yucca gigantea* and *Y. Guatemalensis*, from Central America. At the rate all plants are growing here it will not take many years for most of them to bloom and fructify, thus affording ample material for study and identification.

F. Franceschi.

At the South Orange Nurseries.

To the Editor of GARDEN AND FOREST:

Sir,—At a recent visit to the establishment of Mr. W. A. Manda I noticed, among other interesting plants in flower, *Iberis sempervirens superba*, which is apparently an exceptionally good variety of the hardy Candytuft. It was sent out by Backhouse, and has flowers of the purest white in dense heads, and the individual flowers are of good size. *I. sempervirens* is evergreen, more reliable for hardiness than *I. Gibraltarica*, and this variety is of a bushy habit, and evidently a fine subject for the garden. Mr. Manda had also in flower *Campanula persicifolia alba grandiflora*, which formidable name has been given to a superior form of this common Bellflower, which is too uncommon in hardy-plant gardens. The corollas of this variety were much deeper and more bell-shaped than those of the type, which is a favorite plant wherever grown.

*See *Pharm. Rundschau*, 1891, pp. 162-165. *Ibid.*, 1886, p. 161.

I found also in flower the attractive *Genista Andreana*, which, as GARDEN AND FOREST has before noted, is an improved Broom with large yellow flowers, having bright chestnut-colored wings, and of evergreen habit.

Erica pygmæa is a species of Heath not before seen by me. It forms a dense mat of dark green, scarcely rising above the surface of the ground, and later on covered with pleasing purple flowers. Good mat-plants are one of the attractions of the hardy garden, and where Heaths will thrive this distinct dwarf species should be a welcome plant. It seems to be of easy propagation by division. There were numerous other hardy plants in flower, mostly familiar subjects, and for a dense mass of brilliant yellow, *Achillea tomentosa* was noticeable.

The loss of *Anemone Japonica* seems to have been complete here last winter, and this, I think, has been the general experience in this section. *Hypericum Moserianum*, as usual, was badly cut down, but is now beginning to shoot at the base. This beautiful plant, I think, may now be considered root-hardy only in this section, and, therefore, classed among hardy herbaceous plants. Greenhouses, with the outside temperature of ninety degrees, are not places where one cares to linger, but I noticed, in a hurried review, that Mr. Manda's new hybrids of *Rosa Wichuraiana* were doing admirably, and were as vigorous as the type. These are crosses with some of the perpetual Roses, and have single or semi-double flowers of large size. *R. gigantea*, growing on a bench, I hope to see in flower and report on later. Some strong plants of *Myrosmia cannæfolium*, which is being advertised as the white Canna, with most remarkable qualities, reminds me to ask whether any one has succeeded in flowering it. This plant was put out by Dammann in 1893, with most attractive claims. It is very obdurate in showing its flowers under any conditions of treatment. It is suspiciously like a *Hedychium* in habit and appearance, and its identity will be in question until it flowers.

Elizabeth, N.J.

J. N. Gerard.

Meetings of Societies.

Meeting of the American and New Jersey State Forestry Associations.

THE idea of holding peripatetic forestry meetings, and combining instructive excursions with sessions for the discussion of topics with special relation to the regions traversed, was first carried out in August of last year, when the American Forestry Association met under the auspices of the New Hampshire Forestry Commission in the White Mountains. The success of that meeting, both from the social and forestal point of view, suggested a repetition this spring in southern New Jersey, where, with the formation of the South Jersey Woodmen's Association and the New Jersey State Forestry Associations, the movement for a rational treatment of the forest-cover of that state had just received its first impetus.

The meeting began with an evening session at Camden on May 15th; when Mr. B. E. Fernow delivered his richly illustrated lecture, "The Battle of the Forest," discussing the evolution of forest-growth, the forces of nature with which the forest has to contend in order to establish itself and the methods and means employed in this warfare, the evil results of improper partisanship on the part of man, by which not only is the forest resource itself decimated and deteriorated, but soil and water conditions are injured sometimes beyond redemption. Numerous views from this continent and from abroad illustrated the points made.

The next morning found the party on the way to Cape May, over the level sandy alluvial plains of southern New Jersey. The first observation of interest was, that on both sides of the railroad, about two rods away from the road-bed, there was roughly plowed a strip of land about a rod in width, a "safety strip" to protect the forest-growth against the spread of fire from the railroad. This precaution, which has been quite effectual, is a result of the intelligence of the adjoining property holders, who insisted on holding the railroad company responsible for damage in case of fire, and the company found it cheaper to prevent than to pay damages. Colonel Fox, Superintendent of the New York State Forests, who was of the party, stated that on the much-talked of Webb Road in the Adirondacks, another system had been successfully pursued during last summer: a hand-car with a crew and all necessary appliances to put out fires following each train.

If only the owners of forest-land had a proper conception of the value of their property and of the great damage which these fires inflict—to the soil more than to the timber—they would soon be able to get rid of this one source of conflagrations.

The forest-growth of this part of New Jersey is, to be sure,

mostly not of immediate economic value, the heavy timber of the original growth which once covered these alluvial sands having been entirely removed from most parts long ago; a second growth has taken its place, mainly of various Oaks, Yellow Pine, *Pinus rigida*, and occasionally Red Cedar and Holly, supplanted by White Cedar in the wetter portions, repeatedly injured by fires, yet bound to maintain itself, and sometimes in quite thrifty condition. With the fires kept out, by a judicious use of the axe, gradually culling out the inferior kinds and giving advantage to the better classes of timber, these abused areas would, without hardly any outlay, in twenty-five or thirty years become a valuable property. A basket factory, using Sweet Gum, and a sash, door and blind factory, using White Cedar, both situated along this line, give evidence that even now, at some distance from the road, virgin forest-supplies are not entirely exhausted, while the thrifty surroundings of Vineland and of the Russian colony established by Baron von Hirsch show the capabilities of the soil under careful cultivation.

At Cape May the party enjoyed an afternoon stroll on the beach and an exchange of experiences and opinions regarding forestry problems. In the evening an attentive audience listened to an address by Mr. E. A. Bowers, Assistant Commissioner of the General Land Office, on the conditions of the Government forests and the duty of the Federal Government with regard to them. Mr. Bowers took the position that every citizen was a part owner, and hence interested financially in the great national timber domain situated on the western mountains, in a region which for its prosperity is dependent largely on irrigation, and hence on the storage of water-supplies under the forest-cover.

Friday morning saw the party early on their way to Atlantic City. The forestry feature of interest en route was the sand dunes of Seven-mile Beach, below Avalon, which were visited by special train, kindly furnished by the Pennsylvania Railroad Company. The problem of the sand dunes could here be studied in all its phases. The forest-cover once removed from the shore, the light sand is given over to the play of the winds, which drive it landward, and a wall of sand twenty to thirty feet in height is thus gradually moved, progressing from year to year more or less rapidly. A small strip of forest-growth two hundred yards or so from the shore is now impeding its progress, and yet the dune is said to advance at the rate of one foot a year, covering this protective belt. The sand wall is some twenty-five feet high, with a slope of about forty feet on the leeward side encroaching on the timber, which consists of White Holly, *Ilex opaca*, over one hundred and fifty years old, and Red Cedar, with occasionally a Sassafras, an Oak or a Wild Cherry intermixed. The timber is only thirty-five feet high; the sharp sand particles driven by the wind cut off and shear like a hedge the tops of the trees, which are hardly ten feet above the highest level of the dune. It is interesting to note how long some of the submerged trees can retain their vitality, Cedar and Hollies, covered up within ten feet of their tops, still showing life, while the Oaks and Sassafras are dead and crumbling, and the Cherries have shed their seed, giving rise to a new generation on the dune itself.

Where the forest has been removed the action of the wind reaches farther inland, but where the forest-barrier is intact the dune seems to have become quiet enough to allow a natural cover of Sand Grasses to establish itself, which may in time stop its further shifting. Since, however, the land belongs to a real-estate boom company, it is likely that the lots will be considered too valuable to keep the tree-growth intact, and its kindly offices unappreciated, it may have to go as elsewhere, with the assurance that the lots themselves, with houses and improvements, will gradually be drowned in the sand. Even the bathing-beach, which in such places is usually the only attraction, has in many places been spoiled, the sand being blown off and a muddy bottom remaining. The intimate relation of forest-cover to almost all other kind of business was here strikingly suggested, just as on the plains and in northern New Jersey the needs of the city of Philadelphia and other cities and towns for desirable supplies of drinking-water would have suggested the close interest of their citizens to the forest-conditions of those regions.

A beautifully illustrated lecture by Professor J. T. Rothrock formed the feature of the session at Atlantic City. The lecturer spoke of the habits, habitat and value of various forest-trees of eastern states, and laid special stress on the fact that forest-growth was destined to be relegated to the agriculturally poor soils and situations.

Owing to rain it was decided to postpone the sessions at Lakewood to a more favorable season, when it might be possible to arrange for a continuation of the trip through the

northern part of the state. Suitable resolutions of thanks were passed to those who had contributed toward the success of the meeting, notably to Mr. John Gifford, whose good nature and pleasant courtesy was never ruffled by disappointments.

Notes.

London is constantly adding to its park area, and Lincoln's Inn Fields has at last been secured as public property, and is to be transformed into a public playground. The price paid for this area was twelve thousand pounds down, and a pound a year rent for the remainder of the time for which the lease of the Fields has still to run—a period of some 600 years.

The United States Consul at Messina reports that from November to the middle of March the export of oranges from that port was about 340,000 boxes against only 95,000 boxes the year before, and taking the season through considerably more than four times as many oranges were probably sent to the United States as were shipped the previous year. Of course, this increase was due to the failure of the Florida orange crop.

Mr. J. H. Hale writes to the *Fruit Trade Journal*, that after a careful inspection of 100,000 Peach-trees in his orchard, he finds no trace of disease or insect, so that the promise of perfect fruit from Georgia is fair. The dropping of the fruit is all over, and in some cases nature has thinned a little too much, although generally it is necessary to do more thinning, an operation which is essential if first-class fruit is to be secured.

It is estimated that in Georgia, Alabama and Florida about 22,000 acres of land will be planted to Water Melons. This means, with a favorable season, that 10,000 car-loads of melons will be shipped, and since an average freight train is composed of twenty cars, five hundred train-loads or more must be moved, which will make an average of twelve trains every day in the week for six weeks. Altogether, it will require unusual activity to get these millions of melons started on their journey to northern markets.

The Globe flowers, which range in color from the palest citron or almost white to deep orange, need no commendation as they are now to be found in almost every garden of hardy herbaceous plants. According to *The Gardeners' Chronicle*, Dr. Stuart, of Chirnside, Scotland, has succeeded in crossing *Trollius Europeus* on our American wild *Trollius*, which does not deserve the name of Globe Flower, since the pale greenish yellow sepals do not incurve, nor is the flower rat all showy. Some of these crosses, however, are said to be remarkable, since they are of large size, of a deep color, and so double that they are said to look like orange-colored Roses.

Sugar corn from Bermuda now costs fifty cents a dozen ears; peppers from New Orleans, which have been coming in for a week, seventy-five cents a dozen, and large egg-plants from Florida seventy-five cents each. Mushrooms, on account of the plentiful supply due to the hot weather, fell within a week from \$1.50 to thirty-five cents a pound. They sold on Monday for sixty cents. South Carolina now supplies okra; Maryland, Virginia and New Jersey are sending peas, and Long Island furnishes beets and carrots. The scarcity of vegetables several weeks ago after the unseasonably cold weather led to various experiments, and yesterday some hot-house tomatoes arrived from the Isle of Guernsey, too late to command the highest prices.

A bulletin on Chrysanthemums has been prepared by Michael Barker, of the Cornell Experiment Station. It is chiefly a record of the habit of the leading varieties on the market in 1894, and it gives an account of the behavior of the more prominent ones of the two hundred kinds tested. The report is written from the standpoint of the florist rather than of the amateur gardener. Mr. Barker concludes that for the purposes of American growers American varieties are superior, as a rule, to those of foreign origin. The best ones tested at Cornell for commercial purposes, among the yellow varieties, were Eugene Dailedouze and Major Bonnaffon; white, Mayflower and Marie Louise; pink, Mrs. E. G. Hill and Laredo; bronze, Charles Davis and Ingomar.

European critics, according to their mood, have long pitied or scorned American architecture for its persistent use of wood as a building material, even in structures of considerable size and pretension. It is curious to find, therefore, that

wooden buildings of certain sorts are now becoming the fashion in England, where cheapness does not recommend them as it does in this country. The new move has been inspired, however, not by the example of America, but by that of Scandinavia, where many fine old public buildings and churches, as well as private houses, are wholly constructed of wood. The Prince of Wales, we are told, is interested in an Anglo-Norwegian company created to bring wooden structures into fashion in Great Britain; and is having a number of picturesque examples, in the way of houses and lodges, erected on his own estates at Sandringham, and the greater part of Mar Lodge, the autumn residence of his daughter, the Duchess of Fife, has been constructed of wood.

In *The Speculum*, a journal published by the Michigan Agricultural College, Professor Beal gives a history of eleven trees which were planted on Arbor Day, 1887 with a good deal of ceremony. There were elaborate exercises in the chapel; the trees were planted, one in memory of each of the four classes, the different fraternities, the baseball nine, etc., and the President of the college, as the procession passed from tree to tree and saw that they were properly placed, guaranteed that each one should be well cared for. Professor Beal takes up the history of each tree, and in summing up their present condition finds that only three of them are thrifty, four are feeble, three are quite dead and one is about to die. None of the living ones are marked by any label, nor is the history of any of them to be found in the report of the President or in the college paper. Judging from this, Professor Beal is probably right in saying that the chief value of an arbor day, such as the one celebrated in 1887 at the Michigan Agricultural College, was sentimental and that the sentiment was ephemeral.

One of the most attractive floral displays ever made in an American garden was seen in the Arnold Arboretum last week, when the Lilacs were in bloom. About one hundred and twenty varieties of *Syringa vulgaris* were in flower. The collection occupies a wide bed, stretching for more than nine hundred feet up a rather steep slope, along one of the principal drives, and the color of the flowers is well brought out by a high green slope behind and parallel with the bed. Among the most attractive of the varieties in this collection are Marie Lagrange, white; Rubra insignis, dark red-purple; Trianoniana, purple; Madame Briot, red-purple; Geheimath Heyder, pale reddish blue (very large compact panicle); Alba grandiflora, white; Charles X., dark red-purple (an old variety, but still one of the very best); Emil Liebeg, pale blue; Bertha Dammann, white; Virginialis, white; Ambroise Verschaffelt, flesh color; Gigantea, mauve; Carsli, dark purple-red; Maxime Cornu, pale blue (double); A. Lavallée, pale blue (double); Lamarck, pale blue (double); Ludwig Späth, dark red-purple (very late); Philamon, dark red-purple; Alice Macguery, purple-red; La Tour d'Auvergne, dark red-purple (double, very large compact panicle); Félicite, pale flesh color (semi-double); Madame Moser, white; Tournefort, dark purple in the bud, opening bright blue (double).

Large and bright purple-black Tartarian cherries, from California, cost at retail twenty-five cents a pound, while immense cherries known as Centennial, almost equal in size to the apricots now coming from that state, cost forty cents. This showy variety is a California seedling fruited for the first time in 1876. It is of an amber color, freely splashed with dark crimson. Its meaty flesh is remarkably sweet and of excellent flavor, and while the fruit is juicy it has the good market qualities of keeping well and of carrying in good order. The best of several small lots of cherries from North Carolina compare unfavorably with those from California, the highest price for these being twenty cents a pound. California peaches have already been seen here in small advance lots, a box containing eighty fruits selling for \$4.00 at wholesale. The season for citrus fruits from the Pacific slope is nearly ended, and as they come in refrigerator-cars they quickly melt when exposed to the heat. The few Mandarins remaining in the retail fruit-stores are offered at thirty cents, selected Navel oranges at sixty to seventy-five cents, and large shaddocks at \$2.00 a dozen. Huckleberries from North Carolina are quite plentiful and of fair quality for the time of year; the best bring twenty-five cents a quart. A few native plums and some peaches came from Georgia last week, but were not sufficiently ripe to bring good prices. Muskmelons are coming from Florida, but very few of them are of the best quality. Except occasional lots of Russets from the interior of New York state, no more apples are likely to arrive. The barrel stock on hand is being divided into baskets holding something more than a half bushel. Ben Davis is the latest red apple offered.

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLE: —The Defacement of City Parks.....	231
The Live Oak at Drayton Manor. (With figure).....	232
The Wholesale Flower Markets of New York City.....	M. B. C. 232
FOREIGN CORRESPONDENCE: —The Temple Show.....	W. Watson 233
PLANT NOTES:	233
CULTURAL DEPARTMENT: —The Russian Tree Fruits in America.—II.	T. H. Hoskins, M.D. 236
Shall we Irrigate Orchards in New York?.....	Professor L. H. Bailey. 236
Mexican Water-lilies.....	W. Tripp. 237
Cladrasia tectoria, Papaver orientale.....	G. W. O. 237
CORRESPONDENCE: —Notes from Brookline, Massachusetts.....	T. D. Hatfield. 237
Trees and Shrubs at Madison, Wisconsin.....	Professor E. S. Goff. 238
An Enemy of the Larch on the High Alps.....	Dr. H. Christ. 239
Phlox divaricata on the Prairies.....	Professor F. J. Wragg. 239
Does Poison Ivy Discriminate?.....	I. Ten Bosch. 239
When is Rhus toxicodendron Most Active?	Professor John W. Harshberger. 239
RECENT PUBLICATIONS	239
NOTES	240
ILLUSTRATION: —The Live Oak, <i>Quercus Virginiana</i> , at Drayton Hall, South Carolina, Fig. 235.....	235

The Defacement of City Parks.

A FEW weeks ago the Board of Park Commissioners in this city thought they could safely throw open to the public a few small areas of turf in Central Park. They gave notice of this fact, and the reporters of the various newspapers at once began to interview them on the subject. The statements of the commissioners were guarded and cautious. They said nothing which could fairly be interpreted as an indication that any rigor of administration was to be relaxed. They simply said that inasmuch as on certain days some of the lawns were free they proposed to try the experiment with a still larger area of turf. But the bare hint that visitors were to be allowed freedom of access to portions of the park from which they had hitherto been excluded, seemed to arouse a spirit of lawlessness in many visitors which had hitherto slumbered. Testimony is abundant to the effect that the park has suffered serious defacement since this permission was granted, the chief injury being done to shrubs and herbaceous plants in bloom. Branches of showy bushes, like the Snowballs, for example, were carried away by the armful in spite of the police.

A significant fact was stated by a park policeman, who said that for the first few days after the lawns were thrown open people could hardly be persuaded to walk on them. Those who frequented these portions of the park had become so accustomed to walking on the paths and sitting on the benches that they had to be invited to walk in and sit down on the grass before they would accept what was considered such a favor. Of course, it did not take long to educate people up to their new privileges; but the fact that they had already been educated to keep off the grass is certainly worth considering. But, really, it is no greater hardship to keep on the walks in a park than it is to keep on the sidewalk and out of the front yards along the city street. The people who argue that "the parks are made to use and not to look at," may not be aware of it, but their statement is deceptive. The fallacy is exposed the moment we consider that the beauty of a park is its highest use, and, therefore, to destroy that beauty is not to use but to abuse it. When walking by a wildwood border thought-

less people often enjoy themselves by breaking off the branches of flowering Dogwood and other trees and shrubs when they are in bloom, but no sensible person would consider it an inhospitable restriction if visitors were forbidden to mutilate the shrub border of a park after this fashion. Nor is it any hardship in a park which is well planned to insist that people should keep on the gravel when a free use of the grass would destroy it, for the grass is just as essential to the beauty of a park as the shrubbery.

It is pleasant for children, both old and young, to roll on the grass at times, but this is provided for in every well-managed pleasure-ground. The large meadows in Prospect Park are thrown open most of the time, great areas in Central Park are open to the public whenever the grass will permit it, and there are days when as many as 30,000 people have special permits for picnics in Central Park, and often 100,000 people can be seen on the grass at once. It is necessary to keep the players away now and then in order that the lawns may grow green again, and there is no question, taking the season through, that there is more real enjoyment on the grass than there would be if all the turf were always thrown open to every one without restriction. It must always be borne in mind that the primary use of a city park is to rest and refresh the spirit, and for this purpose the grass and shrub borders make a strong appeal to the imagination through the eye and not through the soles of the feet. Of course, where the ratio of visitors to the number of acres is small there need be fewer restrictions, but in populous cities the supreme value of the turf is its restful beauty, and when this beauty is trampled out the park not only loses its charm, but visitors lose their respect for it and are easily induced to deface it by breaking down the shrubbery and in other ways.

The point which we wish to emphasize is that the people of New York have never felt it to be a hardship to keep off the grass, but as soon as there was an indication that this restriction was to be removed lawless persons began to destroy the shrub-borders. If this state of things should continue for a year or so, people would feel that they had quite as much right to break down shrubbery as to walk on the grass. We have been much interested in some of the so-called arguments which have been used by certain papers in Buffalo which are opposed to the building of a fence about one of the parks in that city. These papers have long articles with scare-heads, in which it is asserted that the arrogant Park Commissioners wish to keep the people out of the park and turn it into a hay-field and a nursery for shrubs, or else make it as exclusive as the private grounds of a monarch. On looking at the plan it is evident that most of these so-called arguments are based on absolute misrepresentation. The proposed fence had openings for entrance at all the leading lines of travel. Four of these entrances were made to the full width of the abutting streets, while four more were made for foot-travel. Walks were then proposed on lines which were so direct that there would have been no temptation to leave them for general travel, and we can imagine no reason for the outcry against the fence unless the abutting property-owners should have the notion that it benefits them to have the park seem to be a portion of their own private grounds. So far as we can see from the ordinances there has been no intention of the Park Board to restrict ball-playing or the usual picnic recreations in this place. A disinterested witness to whom we have written on the subject informs us that there are twenty beaten trails across this paradise-ground in every direction, and these trails are evidently not worn by people who wish to use the park as a park, but who simply want to use it as a thoroughfare, and insist on being allowed to make the shortest cut to their destination. No one considers himself oppressed because he has to turn a corner in a city instead of walking through a block. Why should it be a hardship to follow a good path when the distance is almost as short as an absolutely straight line across the grass, which will soon become a beaten track and utterly destroy its beauty?

Some time ago we had occasion to comment on the Buffalo park reports, and these newspaper articles confirm what we have said before. There is an insufficient force of park police in that city, and the people have been allowed to abuse their pleasure-grounds so long that they consider any effort to curtail their privilege to injure the parks as an infringement on their personal rights. They have kept repeating to themselves the fallacious statement that the parks belong to the people, and, therefore, the people have a right to use them, when the proposition, accurately formulated, would be this: all the people have a right to enjoy the beauty of the parks, and, therefore, a few people have a right to destroy this beauty. Fortunately, the administration of parks in other cities was begun under better auspices. In New York, Brooklyn, Boston, Chicago and San Francisco the people have been taught to appreciate their parks as parks, and nowhere except in Buffalo has any reputable organ of public opinion ventured to argue that a park is essentially an open thoroughfare. A space which people are invited to despoil is really no park in any proper sense of the word. If public opinion has become so demoralized in any city that proper regulations for maintaining the landscape beauty of their parks are denounced as tyrannous, such parks are doomed to desolation, and it would be altogether more reasonable to sell the land for building-lots than to allow it to become an eyesore.

The Live Oak at Drayton Manor.

THE illustration on page 235 is the reproduction of a photograph of what, so far as we can judge from our observations, is the most massive, symmetrical and imposing tree in eastern North America. It is a Live Oak, *Quercus Virginiana*, standing on one side of the entrance to Drayton Manor House, on the Ashley River, near Charleston, South Carolina. The home of the Drayton family, a handsome red brick Elizabethan mansion, was built while South Carolina was a British colony, and it is said that the site of the house was selected on account of this tree, although, as the Live Oak grows very rapidly, it is not impossible that it was planted with its mate on the other side of the drive, where the house was first built. At the present time the short trunk girths twenty-three feet four inches at the smallest place between the ground and the branches, which spread one hundred and twenty-three feet in one direction and one hundred and nineteen in the other. This tree is growing over a bed of phosphate, and the demands of trade will, therefore, probably cause its death before its time. More than once we have visited this tree, and each visit has increased our reverence for nature as we stood in the presence of this wonderful expression of her power.

Our illustration, for which we are indebted to Mr. Hostie, of Charleston, gives a feeble and unsatisfactory idea of this tree. Some one who sees the picture, however, may be moved to go and look at the original; and this traveler will be rewarded, for no one who has not seen the Drayton Oak can form a true idea of the majestic beauty of the Live Oak, the most beautiful of the fifty species of Oaks which grow within the borders of the United States, or of all that Nature in a supreme effort at tree-growing can produce.

The Wholesale Flower Markets of New York City.

ASIDE from the great auction flower sales held two and three times a week during spring and early summer, and the sales made by large growers to the local dealers, there are two wholesale flower markets in this city. The old-time stand on Vesey Street, abandoned to fruit and vegetable dealers some twenty-five years ago, was succeeded by the present market about the small triangular park space at the Hudson River terminus of Canal Street. When the flower growers combined to ask the city authorities for the use of this place the open tract

was a dumping-ground for cobblestones and other unsightly city belongings. Improvements were made a year or two later, and at this season the little park, with its shrubby background of flowering Wiegelia and Spiraea, makes a pleasing foil to the garden-like beds of bright flowers on its sidewalks. The second market, which is a division of the Canal Street market, began four years ago, and is better known to the public from its more central location. It occupies the wide street space on the north side of Union Square. In the misty morning twilight, the tall modern business and publishing houses, grim and silent, make a striking contrast to the bustle of flower-selling in the street, and their broken and irregular sky-line suggests the medieval and scarcely more picturesque house-tops of the buildings about a market place in the heart of an old European city.

Of these flower markets very little is known by the public, for even the universal enjoyment afforded by great masses of gay flowering plants, or the interest in the displays for their business or commercial value, is not sufficient to bring out visitors to the early sales. During the evening, flower-laden wagons start from the suburbs of Jersey City, from West Hoboken, Staten Island and Long Island, and by midnight the earliest comers have secured first choice of location, the same place being held throughout the season, if possible. The two markets differ but little in the conduct of the sales. At the more central stand, then, the black-covered wagons are headed to the curbs. They are closely packed, the floor, two tiers, and even the top increasing the carrying space. The noisy rumble of the vehicles, as they come one by one, makes part of the roar of early morning traffic, along with belated trucks of jingling milk cans and the newspaper delivery wagons hurrying to railroad stations. Unlike the occasional early riser, who thinks bustle and noise a necessary part of his unusual experience, and that folks who are not awake should be, the men, wakeful and alert, noiselessly chat in pairs on the front seats or stand about in groups, the midnight darkness relieved by electric lights. Within Union Square the benches are closely occupied by men who sit through the night, the humane police officer explaining that they are allowed to wait on the seats provided they do not sleep.

By three o'clock the activity and noise of arrivals is at its height, and the busiest streets of many towns at mid-day is outrivaled. Along with the latest loaded wagons of the sellers come the first empty ones of buyers, and these find places on the outskirts. Suddenly a movement extends along the closely ranged line; men, women and here and there a sleepy-looking child hurriedly move wooden trays filled with plants to the street space at the rear of their wagons, until the long block is lined with two solid rows of flowers fifteen or twenty feet wide, separated along the middle by an open walk twelve feet broad. By half-past three shrewd experienced men and women—the latter generally short-skirted and blue-aproned Germans—are peering through partial light and into deep shadows in search of bargains and choice stock. Only two Italian venders were noticed among the many customers. These advance buyers are peddlers, owners of the low-sided, open empty wagons, and eager to get stock, which is quickly arranged at the end of the lines, in readiness to offer to buyers in small lots at a slight advance. Later in the day the remaining stock of these middle dealers is sold in the tenement sections of the city and in the suburbs along the Harlem and Hudson and in New Jersey towns as far as twenty miles away. Some of the early buyers come to secure plants ordered by them in advance for customers who have engaged a special sort, and occasionally there is eager rivalry and the excited claim that certain stock has been "bestellt." Sturdy, thrifty women carry away their purchases in large, flat baskets, one on each arm, while a few push carts start off with their meagre stock. One or two immense vans belonging to high-class florists are closely packed with choice stock, bought up by

a member of the firm. These roomy vans are especially built for this trade, and besides double walls have heating and ventilating arrangements against any possible cold which might chill tender plants. The ordinary open wagons with low sides are filled with stock selected with a view to the best plants for the least money and the showiest effect in the general arrangement. Feathery Astilbes make a graceful temporary edging to beds of brilliant flowers, five or six dozen Geraniums going into each load. The front step, an improvised platform at the rear and extensions at the sides are all pressed into use. The only lull in the activity after midnight is the half-hour before five o'clock, when the regular trade of store-keepers, street-venders and peddlers is awaited. By six o'clock retail buyers begin to pass up and down the long array of flowers and to buy single plants of different sorts, the pots clumsily wrapped in newspaper, and an artist making a water-color sketch of the gay scene gets more notice than is helpful. By half-past eight the fee of twenty-five cents for each wagon has been collected by a deputy from the Bureau of Markets, the wagons have left, and cleaners from the Park Department have removed all trace of discarded plants and broken pots.

The flower markets begin early in April, when three or four wagon-loads are offered in the damp and chilly dawn. The trade gradually grows, and by the first of May thirty wagons are assembled at each market every morning, Saturday being the busiest day. Now and until the close of the season, about July 1st, as many as seventy-five loads will be disposed of daily at the two places. A moderate load contains 40 to 50 trays, and these each hold one or two dozen plants, so that a large wagon may carry 2,000 plants. One dealer, together with an assorted stock, offered of Verbenas alone 1,000 plants in boxes holding a dozen. Easter Saturday and the morning preceding Decoration Day are the big days of the season, when it is not unusual for one grower to send in two or three wagon-loads instead of one. The plants must be well grown and in luxuriant flowering, since each one is finally subjected to selection by a retail buyer for a place in the window or door-yard. Geraniums are the most popular, as the showiest, most persistent in bloom and the easiest grown, and they continue in demand from the opening to the closing day. Boxes of deep orange-colored Calendulas, with the smaller-flowered yellow Daisies, *Anthemis tinctoria*, are among the showiest effects, and hardly less bright are masses of Nasturtiums of assorted colors, patches of Marigolds and of Lantanias. Lady Washington Pelargoniums make an effective show and win many buyers, while Fuchsias covered with heavy buds and the blue Corn Flower of their grain-fields are in especial favor for retail sales to German householders. Old-fashioned plants, as Bachelor's Buttons, Cockscomb, Old Man, Scarlet Sage and Musk-plant have a steady demand, and creepers and climbers, as Stone-crop, Ice-plant, Myrtle, Creeping Charlie, Vinca and Tradescantia, are shown in quantities. Memories of house plants familiar to a far-removed childhood, of almost forgotten country gardens, and of haunts by shady brook-sides are called up by plants of Lemon-verbenas, Lobelia, Oleander, House-leeks, Phlox, Cigar-plant, Ten-weeks'-stocks, Thrift, Sweet William, Zinnias, Forget-me-nots and Ferns. Trays of vegetable plants are also among the offerings, 120 plants of tomatoes selling for thirty-five cents. Other prices at this season are a dozen and a half Zinnias for one dollar, while the same sum will buy thirty-five flowering Verbenas, a dozen good Geraniums, two or three boxes of Pansies according to quality, each holding thirty plants, two dozen Musk-plants, twelve large plants of Vinca, or two dozen Pyrethrums or Armerias. Roses of all varieties and grades and Hydrangeas are abundant and generally well grown and stocky, though some plants are leggy. In the Easter season, Lilies, Azaleas, Hydrangeas and Cytisus are the principal offerings. Bulbous plants are comparatively rare. At the Canal Street market the trade

is in bedding-plants and entirely wholesale, while at Union Square many decorative plants of large size are seen, such as Portugal Laurels, Palms, Rubber-plants, and Arbor-vite sheared into various shapes. More stock is being offered each year, and prices this season have been lower than in former years. The growers estimate that it costs a dollar to grow a dozen Geraniums, while ordinary stock brings only seventy-five cents. Plants of Geraniums must be very good to command \$1.25, and the choicest stock noticed, extra-large, full-flowered plants of the variety General Grant, brought \$2.00 a dozen.

The market season is over by the end of June. The cultivators then occupy themselves in repairing greenhouses, growing on stock for fall and winter cuttings, and in caring for their bulbs of Easter Lilies from Bermuda and Rose stocks from Belgium. The winter is given up to anxious care and cultivation for the spring rush, which rounds out the year. Altogether, it is hard work, which yields not more than a fair living and often but a frugal one. Cold days and stormy weather operate against sales, and large receipts of strawberries and other fruits take the hucksters into other lines of trade and make slow sales and low prices in the flower markets. Dull market days are often helped out by buyers from Springfield, New Haven and other towns in near-by states, who can buy more cheaply in the metropolitan markets, even when the cost of transportation by water or rail is included.

It is not possible to give an approximate idea of the total sales in these markets for a season, but the flower trade has assumed great importance since the beginning of the century, when there was but one commercial florist in the United States. There are now nearly 5,000 establishments for growing flowers, and four-fifths of this business has been developed within the last twenty-five years. The last census report states, among other interesting items connected with floriculture, that 38,823,247 square feet of glass are in use, covering more than 891 acres. Of these establishments, 312 are owned and conducted by women. The value of fixtures, heating apparatus and tools amounted to \$40,000,000. Fuel, freight and express, and postage on some 20,000,000 catalogues are other large items of expense. The receipts from sales of cut flowers are put at more than \$14,000,000 a year, and from plants and shrubs at above \$12,000,000.

M. B. C.

Foreign Correspondence.

The Temple Show.

THE annual exhibition of the Royal Horticultural Society, which was held this week in the Temple Gardens on the Thames Embankment, proved a success in every respect. The weather was on its best behavior, the exhibits were of a high order of merit, and the crowds of visitors which thronged the lawns and the five large marqueses on each of the three days could not fail to satisfy the financial secretary of the exhibition. Compared with previous exhibitions of the same kind, the present one excelled in the more tasteful arrangement of the plants, flowers, etc., and in the quality of the pot-grown specimen Roses. Orchids were as numerously represented as ever, but there were fewer large specimens and much fewer novelties among them. This probably was due to the fact that a large international horticultural exhibition was being held at the same time in Paris, and this necessitated a division of the forces of some of our most powerful exhibitors. Notwithstanding these slight drawbacks, however, the show was a magnificent display of high-class horticulture, such as Englishmen might justly feel proud of. The Roses were magnificent and quite justified the observation of a lady which I overheard: "Among all the beautiful and wonderful things here to-day the Rose stands supreme."

CRIMSON RAMBLER attracted a large share of attention, beautiful specimens a yard across, bushes as well as standards, in pots, of course, and covered with large clusters of brilliant carmine-red flowers, each one and a half inches

across, semi-double, elegant and charming, both in bud and when fully expanded. I counted twenty and more open flowers on each of many of the clusters. Another new Rose of great promise is Paul's Carmine Pillar, of which fine examples were shown. The flowers are borne singly on the ends of the branches, each flower being a cup nearly five inches across, quite single and of a rich rose-crimson color, with a large white eye. It was shown by G. Paul & Son. Another attractive Rose was a new one of last year, named Duke of York, a China bedder and winter flowerer. Messrs. W. Paul & Son showed specimens of it in pots, which were flowering for the second time this year, the flowers being clustered, small, but pretty, both in bud and when expanded, their color a bright rose-crimson.

Among the many Rhododendrons shown, the most beautiful by far was the Mollis hybrid named Anthony Koster, the trusses being large and crowded, the flowers Mollis-like in substance and form, and the color a glistening lemon-yellow. There are hundreds of Ghent and Mollis Azaleas in flower at Kew now, but not one that is so pleasing in all respects as this. It was shown by Messrs. J. Veitch & Sons. Magnolia Watsoni is not first-class as a pot-plant, at any rate as shown by Messrs. Veitch. The reverse may be said of the pretty hybrid shrubby Spiraea named Van Houttei, which was shown in pots as bushes a yard through and covered with elegant wands of May-like flowers. It is the best of the Spireas in flower in the open at Kew now. It is a hybrid between *S. trilobata* and another, probably *S. confusa*, and is often met with in gardens under the latter name.

LILAC, SOUVENIR DE L. SPÄTH, was the best of all the varieties of Lilac shown, its enormous racemes of large plum-purple flowers being very much admired. The best of the white varieties was Marie Legraye. New varieties of Tree Peony, from Messrs. Kelway, of Langport, whose exhibit of hardy plants generally was a great attraction; some splendid specimens of Streptosolen Jamesoni, from Mr. Bennett-Poë, and a collection of fifty-six varieties of Darwin Tulips, from Messrs. J. Veitch & Sons, were among the most noteworthy of the exhibits of hardy plants.

CLERODENDRON A'PRIORI, a variety of Clerodendron Balfouri, with flecks of red in the white calyx, is likely to find favor as a novelty with growers of stove climbers. Messrs. Veitch's seedling Phyllocacti are an advance upon what we have had hitherto among this beautiful but neglected section of Cacti. Their improved races of Streptocarpus are equally progressive, new colors as well as new shapes being observable among the large number of seedlings shown this year. What they call *S. gratus*, however, is nothing but *S. Watsoni* showing greater variety of color. These are remarkable for their large clusters of flowers and their large somewhat "floppy" leaves.

CLEMATIS.—Messrs. G. Jackman & Son showed a set of six varieties of the new hybrid Clematis, raised from *C. coccinea* and a large-flowered variety named Star of India. I noted one of them last year when the variety named Countess of Onslow was awarded a first-class certificate by the Royal Horticultural Society. The other five are Duchess of York, pink; Duchess of Albany, rosy mauve; Grace Darling, mauve; Sir Trevor Lawrence, crimson, and Crimson Beauty, deep red, with a purplish shade. The flowers of all these have the petals arranged so as to be almost tubular at the base, and they are thick and fleshy, as in *C. coccinea*, but twice or thrice as large. Messrs. R. Smith & Sons again showed a grand group of specimens of the large-flowered Clematis, which, if not quite equal to those shown last year, were yet of such quality as to excite admiration, if not envy.

MILTONOPSIS BLEUII VIRGINALIS would be better—that is, more correctly—designated if called Miltonia vexillaria virginalis. Whatever its origin, it is simply a white-flowered form of the last-named, a superb one, truly, but bearing no evidences of its reputed hybrid origin. It was shown by Monsieur Charles Vuysteke, of Belgium, and obtained a first-class certificate. The flowers were four inches across,

pure white, save a small dash of rose-purple at the base of the petals and a star-like blotch of pale brown at the base of the lip.

EPIDENDRUM STAMFORDIANUM was shown in magnificent condition by Sir Trevor Lawrence, a big plant bearing about a dozen strong branching spikes of bloom, springing from the bases, and not from the apices of the pseudo-bulbs, a character peculiar to this one species in the large genus Epidendrum. The flowers are colored pale yellow and red, and are fragrant. Masdevallia nycterina was shown by Baron Schröder with three hundred flowers arranged round the bases of the leaves like a collar. It was a fine example of cultural skill. The beautiful Cattleya Hippolyta was shown by Monsieur Hye-Leysen with a spike two feet high bearing eight flowers. Miltonia Phalaenopsis, Princess of Wales, a remarkable variety, with the lip almost wholly crimson, was shown by Messrs. F. Sander & Co.

CYPRIPELIDIUM STONEI PLATYTÆNIUM was represented by a fine plant bearing two scapes, each with two flowers. It is said to be the largest of the very few plants of this rarity known to be in cultivation, and the price it was valued at by dealers was eight hundred guineas! It was awarded a first-class certificate, a superfluous distinction in this case.

The group of new stove and greenhouse plants exhibited by Messrs. F. Sander & Co. contained fine specimens of their Dracæna Sanderiana, D. Godseffiana (awarded a first-class certificate), Heliconia illustris rubricaulis, Ludovia crenifolia, Begonia Rajah, Sarracenia, Darlingtonia, Ari-sæma fimbriata, etc.

Altogether there was a marked absence of really new and striking plants this year, compared with other years. I think connoisseurs were attracted most by an indifferently flowered plant of Incarvillea Delavayi, shown by Sir Trevor Lawrence, I believe, for the first time in England, although well known to Continental growers. It received a first-class certificate.

LESCHEAULTIA BILOBA MAJOR.—A large group of this beautiful blue-flowered Australian shrub was shown by Messrs. Balchin, of Hassocks, in Sussex, now famous for the cultivation of this and other rare greenhouse plants. Nothing could be more effective among blue-flowered plants than this Leschenaultia as grown at Hassocks, and few plants are more deplorable than it is when grown with the ordinary greenhouse collection. We cannot grow a presentable specimen of it at Kew.

Ivy-leaved Pelargoniums were exceptionally good as shown by Mr. Jones, of the Ryecroft Nurseries, the plants being dwarf and crowded with flowers, all double, and of every shade of color between white and crimson. Show Pelargoniums were also well represented by groups of large specimens from Mr. Jones and Mr. Charles Turner, of Slough. The plants from the latter establishment were fully a yard across, and profusely flowered as only Mr. Turner knows how to flower them.

Messrs. T. Rivers & Sons, of Sawbridgeworth, maintained their great reputation as cultivators of exhibition fruit by contributing a group of Nectarines grown in twelve-inch pots, each plant being about four feet high, covered with fine healthy leaves and bearing about twenty large beautifully finished fruits. This exhibit deservedly won the only gold medal awarded.

There were great collections of fruit of all kinds, vegetables, herbaceous plants, Ferns, Caladiums, Pansies, Begonias; in fact, of every class of plant that finds favor with cultivators, and all first-class. The Roses were, however, the feature of the exhibition.

W. Watson.

London.

Plant Notes.

IRIS MACRANTHA.—This Iris, introduced by Max Leichtlin two years since, is an *I. Germanica* with very broad foliage and very bold flowers of the largest size, superior in the latter respect to any Iris yet introduced. It is, of course, a bearded Iris, and the large standards are light blue-purple,



the falls are richly colored and somewhat vinous-purple in tone. The plant is of medium stature. This variety differs little from the German Iris from Amasia, which has been noted in these columns as a bold flower.

IRIS PALLIDA, var. *DALMATICA*.—Among Irises this variety, long since introduced into cultivation, stands prominently as one of the best for the garden. It is a plant of vigorous, free-growing habit, with bold leaves, and flowering-stems nearly four feet tall. The dark lavender flowers are of fine form and highly perfumed, reminding one of the Locust-flowers. In flower this plant has an air of great distinction as well as beauty. There are many hybrids of *I. pallida* among the German hybrids, usually easily recognized by their thin withered spathe valves. One of the best of these hybrids is Madame Elmira (Woolson), whose flowers are not as bold as those of the Dalmatian type, but are of a much lighter lavender color, and also well perfumed.

PYRETHRUM PARTHENIFOLIUM.—There are no flowers more popular than the Daisies, albeit they are not specially appreciated by the farmers. No composites will probably ever supplant white Daisies in the affections of the public, but in cultivation or the garden the colored Daisies, or Pyrethrums, prove universally acceptable. The plants are reliably hardy, and their handsomely cut foliage is very attractive. They flower very freely in a wide range of color, generally from the faintest flesh shade to a brilliant crimson. Florists have produced many double-flowered forms, which somewhat resemble Anemone-blooms, but the most graceful ones are single, which are decidedly less heavy in effect and better in color. A good range of colorings may usually be had from a packet of seed, to be had of most seedsmen.

VINETOXICUM ACUMINATUM.—This plant, often called the Mosquito-catcher, should have a place in every collection of herbaceous plants, as it is one of the showiest things at this time of the year and remains in bloom several weeks. The flowers are star-shaped, creamy white, in short cymes, generally springing out of the sides of the stems between the leaves, and not from the axils, where most flowers are produced. It would seem to be a climber in its native habitat, as the stems have a manner of growing as if accustomed to twine on contiguous herbage, but they do not seem to mind the want of support in the least, and the plants look all the prettier without it. Propagation is easiest effected from seed, of which the plants produce a plentiful supply; cuttings of the ripe wood will root if put in a humid atmosphere. The flowers of this species secrete a viscid substance and catch insects much in the same manner as the "Cruel-plant," *Physianthus albens*. They both belong to the Milkweed family, along with such plants as the Stephanotis, Hoya and the like.

Cultural Department.

The Russian Tree Fruits in America.—II.

THE fact that I took up my abode among the hills of northeastern Vermont, and the added fact that from boyhood I had been an ardent lover of horticulture, and especially of fruit-growing, led me of necessity to search for such varieties as would endure the almost Arctic severity of that section of New England. The first five years were given to the trial of what were regarded and recorded as the most hardy sorts far north. But I very soon discovered that altitude was an even more important factor than latitude. In Bangor, Maine, on exactly the same parallel (forty-five degrees, N.), many of the standard Apples and Pears can be grown; while on Lake Memphremagog not one single tree on the list could be relied upon, and, in fact, none of them ever did, in my grounds, reach bearing age. Varieties grown about Montreal were also entire failures, from the same cause.

My attention was then turned to a search for native varieties. Along most of the well-traveled roads there was no lack of Apple-trees capable of resisting the climate; but all, so far as I could learn, were of very poor quality and small size. Gradually, as I became more familiar with the country and the people, I was able to learn of farmers who had a few

Apple-trees producing fairly good fruit and capable of resisting the climate; but I did not find then, nor have I since noted, a single instance of such fruit being increased by grafting or budding, these simple arts being seemingly quite unknown. Continually on the alert for anything of the kind, I have now, after thirty years' residence, been able to find among our people only three native Apples of any commercial value. One of these, Scott's Winter, is now grown all through the "Cold North," from Maine to Minnesota, and is generally regarded as one of the best native long-keeping ironclads. The others, Magog Red Streak and Newport Winter Sweet, have a local reputation and are considerably grown.

The importations of Russian varieties plainly demonstrated that there was a race of Apples which would resist our severest climate and thrive. But here again disappointment awaited us; for not one of the hundreds of varieties which were imported proved to be a long keeper in our climate. Grown in Russia, up to six hundred miles farther north than our northern boundary, they might—at least some of them—be good keepers at home; but in the northern tier of American states, and even in the Canadian provinces, they all proved themselves, however otherwise acceptab'e, to be deficient in keeping qualities for winter. And this continues to be true to-day, with few and rare exceptions, not only for the imported trees, but for nearly all seedlings grown from them, or from crosses on our older varieties of native origin. Up to date it may be said that fine in size, quality and beauty as are many of these Russian tree fruits, not many of them are reported which are at once good winter keepers and fully possessed of other required market qualities. We are anxiously waiting for such to appear, and all growers will hail their advent with real gratitude.

Newport, Vt.

T. H. Hoskins.

Shall we Irrigate Orchards in New York?

IN the current discussions of fertility of the land, nearly the entire emphasis is placed upon the importance of supplying nitrogen, phosphoric acid and potash; but I am convinced that it is quite as often necessary to enlarge upon the importance of water. It is well known that all arable soils contain much more plant-food than any crop, or even any twenty or more crops, can use. The chief aim of tillage is to render the greatest amount of these materials available to plants. In order that they may become useful to crops, these materials must enter into solution in water; and, all other conditions being favorable, the more water the soil has the more plants will grow. In very many cases, an application of water is much more advantageous than an application of fertilizer. This is well shown in many of the arid lands of the west, where a small amount of irrigation renders the soils wonderfully productive.

Just how much, if any, water can be added to agricultural lands in the east with profit, must be answered for each individual instance; but for orchard lands it is a question if, in general, irrigation can be profitable. We must first determine if fruit-trees can profitably use more water than normally falls in the rains. There are two ways of attempting a solution of this complex question. We might attempt to make an estimate of the amount of moisture evaporated by an orchard and then compare this amount with the rainfall; or we might observe the experiences of careful orchardists extending over a series of years. There are so many uncertainties in the former method that one is forced, in a practical discussion, to rely mostly upon experience and upon general considerations respecting plant-life. In the first place, it is to be observed that there have been no careful experiments upon a comprehensive scale in irrigating orchards in the east, and we are obliged to draw our illustrations from experiences in irrigating annual crops. Practically, all these experiences show that irrigation is capable of greatly increasing the yield, and this, too, when the natural rainfall has been well conserved. Whether the added yields are ever or always worth the extra cost, is a question which need not be considered here; the important point to be noticed is that the land is capable of giving a larger product than the average rainfall will allow.

But does this conclusion apply equally well to orchards? In this case we generally do not need more growth, but more fruit; and it is plain that if a tree is capable of bearing as many good fruits as the branches will hold with the normal rainfall, it would be folly to apply more water. We all know that the well-tilled orchard is capable of doing this. It was done in numerous cases in the drought of last year in New York state, even when there was no attempt to conserve moisture. Irrigation would unquestionably give us more growth, and consequently larger trees; but it is very doubtful if this would

mean greater profit. And in drawing observations from the effects of irrigation upon annual crops, we should remember that the roots of such crops are near the surface, while those of trees spread far and deep.

The fact is that we are now wasting a large fraction of our annual rainfall, and it is useless to talk of irrigation until people have arrived at the point of saving the water which nature gives them. The average annual rainfall of New York varies in the different parts from about thirty-five to over fifty inches—that is, nature spreads a sheet of water three to four feet deep over our lands every twelvemonth. Much of this falls in winter and very early spring, to be sure, but even this portion of it may be saved to a much greater extent than most persons are aware. I venture the assertion that if the cultivator were to do his utmost to save this great benediction of the heavens, not only the orchards, but most other crops in New York state, could not be irrigated with profit. It is not my purpose to discuss the methods of conservation of moisture at this time. They have been explained over and over again. They consist, essentially, in mulching the land with a shallow layer—generally a dry one—of surface-soil; in plowing very early in the spring before the soil-moisture has been lost into the atmosphere; in covering the land with herbage in fall and winter, and, in the case of cover crops, of plowing them under at the earliest moment in spring, before they have evaporated much moisture from the soil.

There is another point respecting the utility of soil-moisture which should not be overlooked. Very many of our lands contain as much available plant-food as the average soil-moisture can utilize. In such soils it is idle to apply more plant-food without applying more water at the same time, or, to state the case differently, without improving the methods of cultivation so as to save the greatest possible amount of the rainfall. The drought of last year cut short the growth of much nursery-stock in western New York, and nurserymen are now asking if they should not have applied nitrate of soda, or some other commercial form of nitrogen. The probability is that such applications would have been of no avail unless the tillage had been improved at the same time; and it is a question if tillage alone, if it were begun early before much of the soil-moisture had been lost, would not have given the desired results. At all events, it is certain that the effect of much of the fertilizing of land is lost because the tillage is not improved, and the greater the outlay in the application of commercial plant-food, the greater should be the attention to tillage and conservation of moisture.

If all these considerations are well taken, it is evident that, instead of recommending irrigation, we should urge the saving of the water which we already possess. When any person has done his best in this direction he is in position to consider the feasibility of applying water artificially to his lands.

L. H. Bailey.

Cornell University.

Mexican Water-lilies.

THESE species are worthy of special mention, being among the most attractive and deserving of general cultivation. All lovers of aquatic plants, botanists and others, are indebted to Mr. C. G. Pringle and other collectors, who have of late years brought these Water-lilies again to notice. Five years ago I received a root of the species *Nymphaea Mexicana* for trial. This proved far superior to the well-known *N. flava*, although it is almost identical in form, size and color. Its flowering habit compared favorably with any of the free-flowering varieties, while it is well known that *N. flava*, under cultivation, is the shyest bloomer and most unsatisfactory of any. *N. elegans*, a most charming species, was also received from the same source. It is a moderate grower and well adapted for cultivation in tubs, small basins, etc. *N. gracilis*, of recent introduction, is one of the most desirable kinds in cultivation. It is the only tropical species with white flowers which blooms in the daytime. These flowers are of the Stellate type and stand well above the water. The rich, golden yellow stamens and the delicate fragrance are the characteristics of this variety.

The new blue Water-lily, as figured and described in GARDEN AND FOREST, May 22d, page 205, is entirely distinct from any other blue Water-lily in cultivation, and corresponds with one I have raised from seed, received from the same source as *Nymphaea gracilis*. The plant resembles *N. gracilis*, while the flowers are much larger, with the same long-pointed buds. The flowers open early in the day and remain open longer than those of the Zanzibar species. They are borne on stout peduncles and stand well out of the water. The leaves have long petioles, as if they grew naturally in deep

water. They are light green above, with a few blotches, and of a dark purple beneath. One striking feature of the stock of this blue Lily is that it produces no seed, consequently it is difficult to propagate. At the same time, it is a most profuse bloomer. Another good feature is that strong-growing plants will ripen a tuber that can be preserved with more certainty than those of the Zanzibar type, when large flowering plants have been grown the previous season.

Clifton, N. J.

W. Tricker.

Cladrastis tinctoria, the Yellow-wood, is bearing an extraordinary heavy crop of flowers this season. It is one of the most beautiful of the low-growing trees when in flower, and yet in Washington, the home of trees, it is doubtful if there are more than half a dozen examples of it in the city and surroundings. There are two magnificent specimens of it in the Capitol grounds, which have much larger racemes of flowers than we usually see, the one growing on the slope to the south of the Capitol having racemes fully twenty-four inches long. The flowers do not last more than a fortnight, and if the weather is warm their life is shorter still, but the tree is attractive all the season through. It is hardy up to the Canada line, and grows rapidly. The gray bark is of fine texture, and this, with its pleasing ramification, makes it a beautiful object in winter. It has graceful light-colored foliage, which remains late and turns to a clear yellow in autumn. Its one drawback is the brittleness of its wood, which makes its branches liable to break.

Papaver orientale.—The Oriental Poppies last but a short time in flower, but they are well worth the care bestowed on them even to have them in flower for only a week or so during the year. The flowers are in some cases as large as eight inches across, the petals of a bright fiery or orange red, but out of a batch of seedlings we get quite a number of flowers approaching scarlet. This Poppy, being a perennial, can be increased by root division, which is, at the best, a slow and uncertain method of propagation. To have it in quantity the best way is to sow the seed early in the fall in good-sized boxes, where it will soon germinate, and with the protection of a cool frame the seedlings can be left in the box all winter, and by spring they should be potted off into three-inch pots. As soon as they have developed a few good-sized leaves they can be planted out in their permanent positions, where they will flower the following spring. The variety *bracteata* is only a slight variation from the type, having large bracts under the petals; the flowers are lighter in color than those of *Papaver orientale*. A dwarf form of *P. orientale*, called *Triumphans*, has the merit of being very floriferous.

Botanic Garden, Washington.

G. W. O.

Correspondence.

Notes from Brookline, Massachusetts.

To the Editor of GARDEN AND FOREST:

Sir,—There is now on view a grand display of Indian Azaleas in the home garden of Professor Sargent, in Brookline, Massachusetts. Every plant is a perfect specimen, showing a high state of cultivation. Some are globe-shaped, balloon, pyramidal, besides many irregular, but graceful, forms, and all a mass of bloom. There is almost too much color, and, as the gardener remarked, pointing to one or two plants showing a little green foliage, more foliage would help relieve the eye, and tend to a better appreciation of the various contrasting colors. The collection is made up exclusively of single-flowered varieties. Single flowers of graceful outline like the Azalea, especially those of the Indian type, are more refined, and certainly far more effective, than double flowers of this plant could possibly be. One other reason why single flowers should have preference is that the production of double flowers is a greater strain on the plant, and, as a consequence, they cannot be relied upon to bloom well every season, and the plants are never as massive as those of the single forms.

These Azaleas are cultivated on the European plan—perhaps, more correctly, the Belgian—modified according to the different climatic conditions. Here they are planted in the full sunlight. To many gardeners, with the English pot system of cultivation in mind—and shade, even in England, is considered essential—it appears a bold plan, and it is hard to persuade them to give it even a trial. Nothing succeeds like success, and here is the evidence. A full account of the method of cultivation followed here is given in GARDEN AND FOREST, vol. vii., No. 354.

Among several striking varieties were *Roseum magnum*, a showy flower of beautiful vermilion; *Daphne*, a beautiful

white, one of the finest; Roi d'Hollande, deep red, brilliant in tone; Etendard de Flandres, cerise-pink, a very large flower, with wavy edges; Duc de Nassau, salmon-pink, large flower, very effective; Dame Mellain, blush, with a deeper blotch; Eulalie Van Geert, charming blush; Madame Verschaffelt, crimson blotch on light pink ground; Iveryana, old, but an excellent white variety with pink stripes.

Stored with the Azaleas last autumn, in deep glass-covered pits, unheated, and with no protection beyond the ordinary covering of shutters, were several large plants of the lovely greenhouse climber, *Trachelospermum jasminoides*. They are trained on wire, column fashion. These are all remarkable specimens, some of them eight feet tall and literally covered with pendent cymose panicles of sweet-scented white flowers. There is abundant shiny, deep green foliage, and the plants are so neatly and skillfully trained as not to show the least trace of the wire framework. They are in tubs, which are replaced for larger ones in every three or four years, and manure-water is supplied during the growing season.

It was a treat to me to see the Glory Pea of Australia, *Clinanthus Dampieri*, in bloom for the first time. It is considered quite an achievement to bring a plant along so far. The flowers are vinous-red, with a dark, almost black blotch, at the base of the standard. The species is herbaceous, and is generally raised from seeds sown in small pots in the autumn and held over until the next season, when they are expected to bloom. If sown in spring they might attain a fair size, but would not bloom by autumn, and the chances would be considerably against saving them through the winter. Those who have succeeded with this plant never water it directly in the pot it is growing in, but have the pot plunged in some material which is watered.

Conspicuous on the grounds was a fine tree of *Pyrus coranaria* in full bloom. No one who sees this handsome tree and enjoys its delicious perfume will ever forget it. Its odor is most penetrating, being appreciable fifty yards away, and so acute that I was unable, after passing the *Pyrus*, to realize the slightest trace of perfume from near-by bushes of the well-known aromatic *Calycanthus floridus*.

On the rock-garden is an interesting lot of plants, but my time being limited, I could only note a group of *Primula cortusoides*, very effective in pink shades, and *Verbascum phoenicium*, in purple and white, which made a most striking show.

The drive-ways and shrubberies of the Arnold Arboretum, at Jamaica Plain, are thronged with visitors every fine day. The splendid collection of Garden Lilacs, of which there are more than a hundred varieties, is a great attraction, and judging from the way note-books are brought into use, it is safe to assume any nurseryman near Boston who has a good stock of these Lilacs will do a good business. I noted Ludwig Späth, deep purple-red, large flowers; Philemon, dark purple, very fine; Alphonse Lavallée, deep blue; Virginité, double, rose-tinted in bud, violet when open, sweet-scented and evidently a great favorite; Monsieur Jules Finger, rose-colored, very fragrant; President Massart, reddish purple, very large; Renoncule, double blue, fragrant; Marie Le Graye, showy white.

Wellesley, Mass.

T. D. Hatfield.

Trees and Shrubs at Madison, Wisconsin.

To the Editor of GARDEN AND FOREST :

Sir,—The climate of the north-west is a trying one for many trees and shrubs which are at home on the Atlantic seaboard, and I send a few notes on the hardiness of certain species tested here. Engelmann's Spruce, *Picea Engelmanni*, generally shows the effects of the winter a little on the south-west side—at least in young trees—by the browning of the tips of the younger shoots. This defect is not sufficiently marked to destroy the symmetry of the tree, nor to prevent its being one of our most beautiful lawn trees. *Abies concolor* has proved less hardy, young trees having suffered quite seriously from winter-killing. Even the White Pine, *Pinus Strobus*, sometimes shows the effects of the winter a little in young trees by the browning of the foliage on the south-west side. The Colorado Spruce, *Picea pungens*, and the Douglas Spruce, *Pseudotsuga taxifolia*, endure the winters without perceptible harm, though the young growth of both received quite a setback by the recent frosts.

Eleagnus longipes is not hardy here unless protected. During the winter of 1893-1894 unprotected plants showed little injury to the wood, but the flower-buds were destroyed, as was shown by the fact that protected plants bore fruit luxuriantly while unprotected plants of the same age gave none. During the past winter unprotected plants were killed to the

snow-line, while beneath this line the same plants are not only alive, but have bloomed profusely. The large-flowered Hydrangea, *H. paniculata grandiflora*, endures our winters without perceptible harm, but unless well-watered through our long summer droughts the flower-clusters are so small and develop so unevenly that they have little beauty.

The purple-leaf Plum, *Prunus Pissardi*, has proved unable to endure our winters. Teas' Weeping Mulberry seems entirely hardy with us and forms an attractive lawn tree. The weeping Mountain Ash, however, has suffered badly from sun-scald on the south-west side. The Camperdown Elm seems entirely hardy, and the Kilmarnock Weeping Willow, in sheltered locations, endures the winter with little harm.

The Amoor Tamarisk, *Tamarix Amurensis*, is not at home in Wisconsin. The young growth kills back more or less every winter, and in the winter just past it suffered more than usual. A variety of *Rosa rugosa*, from Russia, obtained from the Iowa Agricultural College, has thus far proved hardy without protection. Its large, deep rose-colored, single flowers appear profusely in June, and occasionally afterward, and are very attractive. This Rose will surely become popular in climates where few other varieties can be grown without protection.

The Yellow-wood, *Cladrastis lutea*, is hardy in sheltered locations, as are also the Maiden-hair Tree, the Gingko and the White Fringe tree, *Chionanthus Virginica*.

Deutzia gracilis kills to the ground every winter unless protected; in spite of a covering of earth it received serious damage last winter. Three species of *Caragana*, received from the Iowa Agricultural College, appear entirely hardy. These shrubs are attractive and popular. The foliage is pleasing, and their yellow pea-shaped flowers appear in May. The Japan Ivy, *Ampelopsis tricuspidata*, while not hardy in exposed situations, is not a complete failure when planted on the east or north walls of buildings. In the past severe winter vines thus planted suffered little.

University of Wisconsin.

E. S. Goff.

An Enemy of the Larch on the High Alps.

To the Editor of GARDEN AND FOREST :

Sir,—The ravages of *Steganoptycha pinicolana*, Zell, in the forests of Larch, *Larix Europea*, on the high Swiss Alps, is the subject of an important monograph by M. I. Coax, Inspector-General of the forests of the Swiss Confederation. This paper is illustrated by a colored plate representing the insect in its different stages of development, the branches of conifers attacked by it and the principal enemy of the pest, which is a fly of the genus *Tachina*. The work is further enriched by a well-executed map of the Engadine, showing the afflicted area in different years.

From time to time the forests of Larch of the high Alps in Valais, Engadine, Dauphiny and Tyrol have been invaded by this little butterfly, the injuries inflicted by it being in proportion, as the forests consist more or less exclusively of Larch. All the adult Larch-trees are affected by the larvæ of the *Steganoptycha*, which appear in spring, and at the end of a few weeks the leaves are eaten or entirely skeletonized. The forest then offers in summer a deplorable appearance; its verdure completely disappears; the trees present a uniform reddish brown appearance, and are more or less covered with little caterpillars, which descend from one branch to another by means of threads sometimes several meters long. During the months of July and August the caterpillars are transformed into chrysalis, and at the end of ten or eleven days the little gray butterflies emerge and cover the branches of the trees with their eggs.

The damages which these insects cause are not immediately apparent. The following year the trees clothe themselves again with leaves and continue to vegetate, but if the ravages of the insect are renewed during several consecutive seasons the forest suffers severely; old trees die, and the existence of even the most vigorous is threatened, for at elevations of from five to six thousand feet above the ocean in the Alps, where plant-food is scarce and the climate is exceedingly rigorous, little is needed to weaken the vitality of trees.

It is practically useless to try to destroy artificially these minute insects, innumerable in numbers. They can only be kept in check by indirect methods, such as the effective protection of insectivorous birds and the mixing of other species of trees with the Larches in the forest. It is only the pure forests of Larch that are exposed to destruction by the attacks of the *Steganoptycha*, which requires for its existence the light found in forests of Larch, which cast very little shade. In the dense shade and humidity which exist in forests of

evergreen Conifers this insect cannot live. And if its larvæ attack isolated Larch-trees in a mixed forest, which is exceptional, the damage is not great, the space left by a dead Larch being soon filled by neighboring trees. M. Coax therefore proposes, in order to save the forests of our high Alps, to plant everywhere in the regions exposed as many trees of *Pinus Cembra* as possible. *P. Cembra* is a very compact hardy tree, casting a dense shade, and although it grows very slowly it produces excellent wood, superior in every way to that of the Larch, while the seeds afford valuable and much esteemed food to our mountain population. With the *P. Cembra* the Spruce, *Picea excelsa*, can be planted; this tree also, although it grows naturally at rather lower elevations, supports the climate of high altitudes, while the Fir, *Abies pectinata*, is not found at high elevations in the Alps. With the Pyrenean Pine, *Pinus montana*, we have then three species to mingle with the Larch to create a forest able to resist the attacks of this fatal butterfly. M. Coax believes that the actual forests of pure Larch in Switzerland are not natural, but have been produced artificially by cutting the ancient mixed woods. On the ground left open by these cuttings it is the Larch which has succeeded so well that it has gradually taken possession of the whole ground. It is necessary, therefore, he believes, to restore, artificially, the ancient and natural condition of the forest.

Bale, Switzerland.

H. Christ.

Phlox divaricata on the Prairies.

To the Editor of GARDEN AND FOREST :

Sir,—Allow me to say, with reference to the remarks of Mr. Chamberlain, on page 209, that I have collected *Phlox divaricata* this spring on dry upland prairie, in poor soil and quite unshaded. This is, certainly, not its usual choice; but in one instance in particular I found an abundance of it growing as described. I have several times collected it in similar situations in Kansas and Oklahoma. I think this is about its western limit. It is moderately abundant as far west as Fort Riley, Kansas, but I have never seen it west of that point.

Coreopsis grandiflora, spoken of by Mr. Craig in the same number, page 208, is just now—May—in full bloom and in great abundance on the prairies here. It is one of the finest of prairie flowers and a general favorite among our many neighbors, whose only garden is the hills and whose gardener is nature. Even in stunted wild specimens the stems are long and the blossoms work up into bouquets with remarkable ease and success.

Oklahoma Agricultural College.

F. A. Waugh.

Does Poison Ivy Discriminate?

To the Editor of GARDEN AND FOREST :

Sir,—Whenever I see a tree in the embrace of a Poison Ivy I take my knife and cut the vine. On the grounds of a few friends and on my own I have cut vines from one and a half to two and a half inches thick, sometimes at the root and sometimes as far up as I could reach, and then tearing down the stems, have uprooted them with my hands. I have done this at all seasons. This spring I have already cut out two dozen Ivies, and have pulled up many others by the roots when my hands were torn by Blackberry thorns, but I never had a trace of poisoning. A friend to whom I mentioned my immunity said, "Of course you are not poisoned, because you are dark." Since then I have been thinking that in the cases of poisoning which had come to my knowledge the victims had been light-haired. A younger brother of mine, who is very fair, has been severely poisoned.

I. Ten Bosch.

When is Rhus toxicodendron Most Active?

To the Editor of GARDEN AND FOREST :

Sir,—The Poison Ivy, *Rhus toxicodendron*, should be avoided at all times of the year, in winter as well as in summer. I make this statement without qualification because I have suffered so frequently from attacks of dermatitis venenata, and I can remember no season since 1876, when I first became acquainted with the plant and had my eyes swelled shut, that I have not had, at least, two or three attacks.

Dr. Havard's remarks (page 203) interested me very much, and I, therefore, desire to give my experience as to this worst of poisonous plants, because it is so common and so universally distributed. Several years ago in January I was walking in Fairmount Park and saw a tree up which was clambering a huge Poison Ivy, at least an inch and a half in diameter. I decided to destroy the plant, at least for a while, by severing

the upper part from the roots. I took a stone and divided the stem by hammering it with a sharp rock which I held in my hand. Some of the juice must have touched my hands, for in a few days I had all the symptoms of *Rhus* poisoning. Since then I have been poisoned several times in winter by laying hold of the plants while out in the fields gathering seeds and capsules for class-work. The white fruits, when not eaten by crows, remain on the plants sometimes until next spring, so that I am quite sure of them.

To sum up in a few words, I have experienced the worst attacks in the months of August and September when the vegetation is rank and the plant is growing vigorously. I have also noticed that in warm autumn weather one is more subject to the poison when actively perspiring.

University of Pennsylvania.

John W. Harshberger.

Recent Publications.

Among the Northern Hills. By William C. Prime. Harper & Brothers, New York. 1895.

This unpretending little book, unlike its companion volume, *Along New England Roads*, does not treat primarily of nature. The papers of which it is composed are for the most part character sketches, the subjects of which are "children of the soil" in the best sense of the phrase—men and women whose lives were contentedly passed under the shadow of the Northern Hills, and whose characters were built up under their influence. Thus the allusions to natural scenery, everywhere interwoven in the body of the narrative, are intended by the author only as the appropriate setting to his series of living pictures. But so deep is his sympathy with nature, so delicate his appreciation of the beauty of the outward world, that the very subordination of that beauty to the human interest brings into clearer relief the ennobling influence upon character, of a right love of the manifold works of the Creator. The book is a moral tonic, and the pure bracing air of the northern Pine-woods is felt on every page.

The stories are simple, both in subject and treatment. "A Northern Sleigh Ride," while awakening in the memory of the reader (if he be country-bred) all the merry associations incident to such an occasion, flashes upon his inward eye the pure unearthly beauty of a snow-covered landscape under the weird light of a winter moon. "Life seen through a Window" is full of quiet pathos and of quiet hope. According to Mr. Prime's observation, life grows very real to one whose vision is narrowed by fate, and there is leisure to learn the spiritual lessons taught by the recurrence of the seasons; the coming of spring on the meadow and hills, the slow passing splendor of autumn, the white covering of the fields in winter—each has a direct message for one whose nature is awake to their subtle influences. Perhaps the paper on "John Ledyard" is broadest in scope. The Hartford boy, whose love of adventure led him over wide seas to many strange lands only to find a lonely grave in the yellow sand where the desert meets the Nile flood, seems to have haunted Mr. Prime's imagination, and he writes of him with tender affection and sympathy. If, in these short stories, there is a lack of humor, its place is supplied by an almost boyish freshness of feeling very delightful in a man who confesses to having reached the Psalmist's limit of threescore years and ten. In fact, it is this freshness of feeling which gives a distinctive charm to this little book. There is a sturdy simplicity and sincerity in Mr. Prime's attitude toward Nature which grows more rare as life grows more complex. His early training was received in the time when, at least, in rural districts, a boy had a recognized place in the household economy. He was rarely coddled or indulged, and though for his education great sacrifices were made, the boy himself had his regular work and personal responsibility about the house, and in the garden and upon the farm. The fishing excursions which were his delight, and the almost equally fascinating expeditions in search of nuts or berries, could only be undertaken when the chores were done. Thus, the thousand joys of field and forest and stream; the ever-changing beauty of the hills and sky of which in boyhood he was scarcely aware, were inter-

woven in some strangely subtle fashion with the thought of duties fulfilled, and the love of nature to be awakened in after years had its root in what was noblest and most enduring in his character.

Though Mr. Prime is not without that perceptive sympathy with nature which the modern world demands in its interpreters, he also possesses something which does not always accompany the higher gift, a wholesome and vigorous love of the country itself. He is familiar with every phase of rural life. Every sight and sound and suggestion of the landscape to him is full of significance. His touch, even when light, is always firm. Many a world-weary man, whose early life was passed amid rural surroundings, will find in these simple records of country life the genuine refreshment of spirit which comes in adult years whenever the chords of association and memory have been touched by a reverent hand.

Notes.

Since the leader in this week's paper was in the form the Park Board of this city has rescinded the order which threw open to the public certain areas of turf in Central Park from which they had been excluded except by special permit.

Owing to a typographical error, Mr. Craig was made to say in our last week's issue that Pelargoniums do not flower in England until September. As a matter of fact, these plants begin to flower at the end of April, and their flowering season continues until September.

A late number of *The Garden* contains a colored plate of a variety of *Cyclamen Persicum* named Salmon Queen. The plant has well-marked foliage, and is said to be of compact habit, and bears freely flowers with long stems and of a thoroughly distinct color. Judging from the plate, this color is a rich salmon-pink, which is very attractive.

We have received some excellent specimens of the Ignotum Tomato, grown under glass by the students in the Horticultural Department of Cornell University. The fruit is large, smooth, solid and of the best flavor. In a note accompanying the specimens, it is stated that plants raised from cuttings are grown to a single stem four feet high, and have been in bearing since the middle of May, each one having produced from six to ten pounds of fruit.

It is reported by Mr. T. M. Steven, Consul of the United States at Annaberg, Germany, that the wood of the Aspen is now largely used there in the manufacture of matches on account of its open structure, ready combustibility and freedom from knots. He suggests to the State Department that inasmuch as this wood is found abundantly in the United States, and is used for little else than paper-pulp, it might be well to test its value here as a material for matches.

Within the past few weeks lemons have advanced \$2.00 a box, the lowest price now quoted for the Sicily fruit being \$5.25 a box. So active is the demand that a lot of thirty-one boxes unexpectedly left on hand after an auction sale brought \$6.62½ in the keen competition for them. Nearly 70,000 boxes will be offered at auction sales in this city during the early part of this week, and 81,000 boxes more are shortly expected to arrive from Sicily. The high prices are due to the warm weather and large purchases by western buyers. The first Rodi oranges of the season, the best oranges to be had here during the summer, arrived last week.

We have never seen *Paeonia Witmanniana* in flower, although strong specimens of it are growing in the excellent herbaceous collection of Mr. E. V. R. Thayer, of South Lancaster, Massachusetts, and elsewhere. It is an early species, which flowers at the same time with *Paeonia tenuifolia*. The flowers are single, cream-colored, with a large cluster of golden stamens. It ought to be useful for hybridizing with other single-flowered kinds, which certainly have a higher decorative value than the double ones. We have often commended the single white-flowered *P. albiflora* as one of the most attractive of hardy plants, and there are others now to be had with single flowers which range in color from light pink to deep crimson. *P. Witmanniana* has a strong perfume with something of the odor of valerian.

Referring to the fact stated by a correspondent of this journal, that the Cherokee Rose has proved hardy as far north as Salem, New Jersey, another correspondent writes that a plant of this Rose has lived against a south wall at Beverly

Farms, Massachusetts, for about seven years. It is somewhat protected with boughs in the winter, and yet it is usually killed back to within one or two feet of the ground. It was killed quite to the ground this year, but is sending up strong shoots again. It has never made any attempt to flower. Mr. James MacPherson writes that there are plants of the Cherokee Rose in Trenton, New Jersey, which have stood out for twenty-five years. They lose their foliage and part of their growth almost every winter.

Several of the agricultural colleges have recently issued timely bulletins on spraying, so that farmers and gardeners the country through ought to be well instructed as to the proper methods of preparing the mixtures against insects and fungi and the methods of applying them. It should be remembered that the applications for fungous diseases are preventive rather than curative, so that one or two sprayings in the early season at the proper time are worth more than half a dozen after the plants have been attacked. The caution is given not to mix the copper preparations in iron or tin, but either in earthen, wooden or brass vessels. The valves, cylinder, piston, etc., of spraying-pumps should also be of brass. After every application of the poisons they should be put away carefully and labeled distinctly.

The latest farmers' bulletin issued by the United States Department of Agriculture is on the subject of Weeds and How to Kill Them. After some general remarks on the proper methods of exterminating annual, biennial and perennial weeds, a few of the pests which have been attracting special attention during recent years are described and figured, together with the best means of combating them. This is followed by a useful table of a hundred weeds which are regarded as about the most troublesome in the United States, giving the common and technical name, with their range and their characteristics. To this is added the time of flowering and the appearance of their flowers, the time of their seeding and the methods in which the seed is distributed, with brief remarks as to the best means of eradicating them.

Three years ago we published an account, condensed from an article in *Forest Leaves*, of the removal of an Elm-tree more than fifty years old, seventy feet high and three feet in diameter, to a distance of 175 miles from the Oliver estate, near Bay Ridge, New York, to the grounds of General Paul A. Oliver, at Oliver's Mills, Pennsylvania. This tree was an off-shoot of the great Penn Treaty Elm which stood in Philadelphia, and measured before it blew down in 1810 twenty-four feet around the base. General Oliver's tree survived its perilous journey back to Pennsylvania after having stood for more than half a century overlooking New York harbor, and a year ago a vigorous sucker started from its root. This spring the sucker was separated from the parent tree and sent to the Park Board of Philadelphia to be planted upon the exact spot where the old Treaty Elm stood, on land which has now become public ground, and is called Penn Treaty Park. It is hoped that this youthful sprout will inherit the vitality of its race, so as to become a specimen interesting in itself as well as for its historical association.

Strawberries were, perhaps, never more plentiful and cheap in the New York markets than on last Saturday, when extra-large New Jersey and Maryland berries, firm and of good quality, sold as low as four cents a quart by the crate. The Maryland season is now nearly ended, and Hudson River strawberries are already coming in. A few cherries from southern New Jersey are here, the best selling for twenty cents a pound. California cherries this season are of large size and beautiful in color, and boxes of Royal Ann or Napoleon Bigarreau, holding ten pounds, sell for \$2.25 in the wholesale markets. These are among the largest and showiest cherries ever seen here. Other good sorts now offered are Cleveland Bigarreau, large, clear red and yellow, the flesh juicy, rich and sweet; Governor Wood, Black Eagle, Oxheart, Black Tartarian, May Duke, Rockport Bigarreau, especially useful for canning; Knight's Early Black, Belle d'Orleans, whitish yellow, half-covered with pale red, and Elton, considered one of the best. Alexander peaches from California sell for seventy-five cents a dozen, and the smaller fruit from Georgia is quoted at thirty-five cents. Huckleberries from North Carolina are unusually abundant and cheap. Watermelons from Florida and Georgia have commanded seventy-five cents to a dollar and a half each, but they have already begun to arrive by the car-load, and are now cheaper. Baskets of assorted fruits for outgoing steamships contain P. Barry pears, Black Hamburg and White Muscat grapes and Ben Davis apples, with apricots and other more seasonable fruits.

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLE: —Plans for Home Grounds.....	241
Are Forest Fires a Necessary Evil?.....	B. E. Fernow.
Garden Herbariums.....	Professor F. W. Card.
Hybrid Birches. (With figure)......	J. G. Jack.
ENTOMOLOGICAL: —New Facts about Scale Insects.—I.	Professor T. D. A. Cockerell.
PLANT NOTES: —Viburnum <i>cassinoides</i>	244
CULTURAL DEPARTMENT: —The Russian Tree Fruits in America.—III.	T. H. Hoskins, M.D.
Irises.....	J. N. Gerard.
Notes on Chrysanthemums.....	T. D. Hatfield.
Gloxiniias.....	G. W. O.
CORRESPONDENCE: —Peach-growing in Georgia.....	L. J. Vance.
Western New York Notes.....	Professor L. H. Bailey.
Poison Ivy.....	B. L. Putnam.
Nymphaea <i>Laydeckeri rosea</i>	R. H. Faunce, M.D.
For the Rock-garden.....	Danske Dandridge.
RECENT PUBLICATIONS	249
NOTES	249
ILLUSTRATION: — <i>Betula pumila</i> \times <i>lenta</i> , Fig. 36.....	245

Plans for Home Grounds.

A CORRESPONDENT writes to say that he has a piece of land nearly six acres in extent and approximately in the form of a square. A river flows along one of its boundary lines and from this the land rises in a gentle slope throughout. He wishes us to indicate what point on this lot we consider the most desirable location for a dwelling-house, and requests us to furnish him with plans for his grounds, or refer him to some book of plans from which he can select a suitable one.

The fact that the writer imagines that he has given sufficient data for a satisfactory plan for his grounds, and his belief that he can find a ready-made plan to suit them, shows that he has not given much thought to matters of this sort. His case, however, is more hopeful than that of many of his countrymen. The average American citizen would probably walk about his land and decide on the location of his future dwelling without any serious study as to how his house, with the other necessary buildings, the stable-yard, the carriage approach and other foundation features of the scheme could be most conveniently arranged, while the thought of preserving the natural beauties of the place would hardly enter his mind, and if it was suggested that these beauties might be enhanced by careful treatment, he would probably decide that all such consideration could be postponed until his buildings were completed. Of course, without knowing something more of the particulars of the case, it is impossible for any one to give intelligent advice, but it is plain that the problem is not one to be solved offhand, and, more than that, the appearance of the place for all time, as well as its convenience and comfort and satisfaction, will depend more upon the frame-work of the plan than upon any attention to details hereafter. If a mistake is made in such controlling elements of the design as the placing of the buildings and their approaches, no after treatment will be able to correct these fundamental errors. This is the reason why we have so often insisted that, if it can be commanded, advice should be taken at the very outset in every case from some one who is able to grasp all the possibilities of the situation.

When we insist that special study should be given to each place, we do not mean that published plans are alto-

gether useless. It is true, however, that they have small value except in so far as they illustrate some special problem. A plan for a small homestead like the one which Mr. Olmsted prepared for the first volume of this paper could by no possibility be adapted to any other place, but in the description which accompanied it the reason for every feature of the design was set forth, and in this way the reader can get some idea, at least, of the kind of problems which present themselves to a conscientious artist who does thorough work and can tell why he does it. Without the detailed description the plan itself is utterly meaningless, but with it we can see how a strong-featured, contracted and irregular piece of ground can be treated so as to have a distinct charm of its own, and can be adjusted to meet the wants and tastes of a particular household. To the uninstructed eye any paper plan means very little, and, indeed, there are many so-called landscape-gardeners who are satisfied if their plan consists of easy flowing lines for roads and groups of vegetation so that the map will make a pretty picture. People who select paper plans are often deceived because they do not reflect that when actually seen with the eye from any point within or without the grounds the picture is essentially different from the ground-plan as it appears on paper. Again, any plan which has proved good in one place would fail in another. The attempt to reproduce a given landscape would at best be but a parody or caricature of the original. All that it is possible to gain from the plans of other places, and even from the study of places themselves, is to get suggestions and to discover principles which can be generally applied.

One piece of advice that is always safe to give is to begin with a thorough investigation of the resources of any given property from a landscape point of view. It may have an attractive, distinct prospect and a noble sky-line in some direction. It may be possible to command a view of a stretch of water which holds the light of the sky and brightens every surrounding object. The property may contain trees which are impressive from their size and age and dignity of aspect. There will always be something in the contour of the land itself, in the vegetation that it contains, or in the outlook into the territory beyond its boundaries, which will furnish a motive for the intelligent treatment of a place. With such a reasonable end in view the designer will pursue his purpose thoughtfully, and will escape the dangers of those who only have a vague and misty notion that they want to make a pretty picture. Of course, this leading motive will vary in every instance. One who is developing a place on the banks of a Florida river would hardly be successful if he were controlled by the same ideas as if he were planning a home-stead in a mountain glen and amid the grandeur of mountain scenery. But, in either case, the effort would be to discover and unfold the charm which is peculiar to the spot—that is, to develop its native beauty rather than to trick it out with some imported ornament.

We do not mean that this principle is the only one to be considered, nor do we hold that home grounds will be always satisfactory provided they are saved from wearing a foreign and incongruous look amid their natural surroundings. Nor is it to be inferred that it is an easy achievement to preserve and enhance the original beauties of any place after making all the constructions that are necessary for the health and convenience and varied tastes of a civilized family. No one but a genuine artist can discern the latent and possible beauties of any piece of ground, and no one but a constructive artist in the best sense of the word can adjust a place to the practical necessities of every-day life, and yet by turning difficulties into opportunities can preserve its essential and poetic charm. It comes to this at last. The laymen who endeavor to develop their grounds on purely natural lines, with an eye to preserving the spirit and sentiment of the place, whether it be of wildwood or seashore, or mountain gorge or smiling meadows and cultivated farm land, may fail, and probably will fail, of the very highest attainment. And yet so long as they treat

nature with reverence, or even with respect, they will not make such pretentious failures as they do whose first effort is to obliterate everything that is native and natural because it is common, in order to make a lawn of such a shape as they have seen in a map, and dress it in such exotic finery as is usually named in the planting list which accompanies the ready-made plan.

Are Forest Fires a Necessary Evil?

THE early outbreak this year of the natural phenomenon of the summers on the American continent, the forest fires, with New Jersey, Minnesota and Pennsylvania in the lead, suggests the inquiry whether nature could not be induced to change her ways. The nature of man, to be sure, is meant, for that is responsible for the phenomenon.

That this change is possible and that proper measures of prevention or organization may reduce the amount of danger to forest-growth from fire to a minimum is evident from the official figures of the forest-fire record in the Government forests of Prussia for 1893-4, which have just been published. The cisatlantic reader of the report will receive a good impression of the efficiency of the measures against forest fires when he reads in the introductory statement that "the very dry weather during the months of March, April and May was responsible for the occurrence of a large number of forest fires, some of them extensive," and afterward finds enumerated sixteen cases only of sufficient extent to be mentioned, the smallest having covered about twenty acres, the largest not over 220 acres. Altogether, not more than 800 acres of forests were involved, half of this being woods from twenty to forty years old.

Since the Prussian Government forests comprise 6,000,000 acres, what is characterized as a "large number of forest fires, some of them extensive," means a little over one hundredth of one per cent of the forest area; and we must not overlook the fact that more than half of this forest is coniferous growth, mostly Pine, and, therefore, especially liable to fire. The cause in most cases is noted as neglect. Locomotives are not mentioned, showing that railroading may be carried on without the necessity of extra risks. During the ten years, 1882-1891, there had occurred in these forests 156 larger conflagrations—96 from negligence, 53 from ill-will, 3 from lightning, and only 4 from locomotives. Seven years out of ten are without any record of fire due to this last cause.

This record, which to us at least would appear like perfection, is due, of course, in the first place to the fact that these forests are under a well-organized management, which insures the constant patrolling of the same by officers in pursuit of their business. Regulations as to the treatment of fires are, therefore, readily enforced, and any incipient fire is soon discovered and put out. Besides this, the method of dividing the forest into blocks or compartments by intersecting avenues, rectangular or otherwise, at regular distances, permits a small force to readily prevent the progress of fires and confine them within the block.

Where railroads run through forest lands, especially in the extensive pineries of the Baltic plain, additional precautions are practiced. Of course, spark arresters are in common use, but the main reliance is laid on a "safety-strip" running along the railroad, and more or less elaborate. Often this is only a clearing, frequently cultivated by the guards as a potato patch or for a field crop. The ideal and most effective treatment is illustrated by a cut showing a railroad embankment, which is, of course, kept clean of inflammable matter by timely burning; then a cleared space about seven yards in width; next a strip of forest fifteen to eighteen yards wide, in which the ground is kept as clean as practicable and free from dry wood, and which acts as a screen for flying cinders; beyond this is a ditch ten to twelve inches deep and five to six feet wide, the dirt of which is thrown to one side, making a ridge which may be planted with broad-leaved

trees. About every twenty rods a cross-ditch is made, so that the whole combination safety-strip, which is about thirty yards wide, is divided into smaller fields, within which it is easy even for one man to confine an incipient fire.

In this country we would hardly need to go to so much expense, but we might considerably reduce with small outlay much of the loss from locomotive fires. The Pennsylvania Railroad Company in New Jersey, from Camden to Cape May, in preference to paying damages to the forest owner, has plowed or scarified on either side of its road a strip about a rod wide, and this is tolerably effective. A ditch within thirty yards from the right of way in the woods, and a timely burning over in spring of this space, would be more effective, and I think any adjoining forest owner would gladly permit such protective measure to be taken by the railroad company on his land, and, indeed, could afford to contribute to the expense.

This cause of our forest fires, then, is largely avoidable; and so would be the fires due to other carelessness, if we should once set out in earnest to punish the offender. The trouble with our laws, even when they are backed by public sentiment, is mainly that the machinery to execute them is absent or too weak. Minnesota, frightened into action by the sad experiences of last year, this winter enacted a fire law, with a commissioner to execute it, and as the appointee is General C. C. Andrews, long known as an earnest forest reformer, good will, at least, is promised in its enforcement.

Wisconsin, which has suffered almost as badly as her neighbor, has also enacted a law, approved on April 17th, in which the chief clerk of the State Land Office is made the forest-warden, with the assistant chief clerk as his deputy. In both cases an organization of existing town officers as fire-wardens is attempted, but whether these officers will be able to do their various duties without neglecting the last one imposed remains to be seen, especially as the provisions for expenses are extremely scanty. These laws, as well as the one so satisfactorily inaugurated in Maine, are modeled more or less closely after the forest-fire law of New York, which it was my privilege to draft in 1885 for the late Senator Low, who incorporated it in the general legislation for the Adirondack forests inaugurated that year. From the fact that it has been followed by others, it may be judged that the principles underlying it conform to the spirit of our institutions and to our conditions, but it will probably take a few more years of terrible loss of life and property before the practical application will have become natural and necessary to our people, and be extended to all states.

Not all forest fires are avoidable, but most of them can be prevented; at least, they need not be allowed to spread beyond control, provided the people will it.

Washington, D. C.

B. E. Fernow.

Garden Herbariums.

UNTIL within quite recent years the practice of preserving dried specimens of plants has been monopolized by botanists. It has not seemed to occur to horticulturists, who, to a certain extent, shape and mould plants to their wishes, that such a record would possess any value to them. Botanists in their turn have acquired a feeling akin to dislike for cultivated plants, or, at least, an idea that they do not deserve systematic study. The man of mere science finds among them too great variations to suit his ideas of how plants ought to grow and deport themselves, and the result is that cultivated types have been allowed to develop, run their course and pass into extinction, with scarcely a record of their existence. Who can measure the value which would result in the interpretation of many scientific problems, were it possible to gain access to an abundance of material of this kind, which would show in the plants themselves the history of such developments?

Professor Bailey, of Cornell University, has the credit of

inaugurating work on this line, and he has shown something of its importance and value. But such a work should not be left to one man. It is sufficiently important to commend itself as a field of coöperative effort by botanists all over the world. Our cultivated varieties of esculent plants have come from widely different sources and conditions. Even those most closely related have often sprung from very different environments. From this it is likely to follow that their adaptations at the present time are quite different. The only possible way to classify these varieties and arrive at anything like reliable conclusions concerning them is by means of the plants themselves. In most cases it is impracticable to have access to all the growing plants needed for any such attempt, even if the desired forms are all still in existence, which ordinarily is not the case. Herbarium specimens, while sometimes misleading, are still the most practicable means of arriving at the end in view. Every one who has had occasion to give special attention to any one group of plants has, doubtless, realized the importance as well as the dearth of material of this kind.

Such material, if easily accessible, might, in some cases, afford the means of detecting an old variety when brought forward under a new name. This could not be done in a majority of cases, but in most cases it would be possible to determine the relations, parentage, and even the strains, from which the new variety has sprung, and thereby in great measure to predict what its usefulness is likely to be. Every practical grower knows what inherent differences are to be expected between a Gooseberry or a Red Raspberry of American parentage and one of foreign parentage. It is needless to say that the herbarium method of studying cultivated plants is the inveterate enemy of all horticultural frauds. When the position and relationships of a plant are accurately known, its possible attainments can also be pretty well determined, and any exorbitant claims which may be made for it can be easily refuted.

The value of such specimens for purposes of illustration in the class-room ought not to be overlooked. Every teacher of horticulture doubtless finds that very many of our cultivated fruits and vegetables even are wholly unknown to a considerable proportion of his students.

Individual effort along such a line as this is not sufficient, however. There ought to be hearty coöperation between every experiment station in the country. Exchanges are easily made, and if those station workers who have good facilities for collecting any class of plants would collect in sufficient numbers to supply them liberally to others so located that this same line is not readily available, it would not be a difficult task for every station to obtain a very satisfactory collection of the cultivated plants of our own country, or even of the greater part of the world, in course of time. It is greatly to be hoped that such work may receive additional attention from horticultural workers in future.

Experiment Station, Lincoln, Nebraska.

F. W. Card.

Hybrid Birches.

NATURAL hybrids among Oaks, and more especially among Willows, are now known to be of such common occurrence that botanists are always prepared to find them. The Birches rank among many other groups of trees and shrubs in which natural hybrids have been collected and described. Perhaps the best notice of hybrid Birches is to be found in the late Dr. E. Regel's well-known monograph of the Betulaceæ, published in Moscow in 1861, in which *Betula hybrida* is described as a hybrid between *B. alba* and *B. nana*, and other intermediate forms are mentioned. Regarding his *B. hybrida*, Dr. Regel says that specimens which he considered as the hybrid between *B. alba* and *B. nana* he had seen from the Jura of Switzerland, from the flora of St. Petersburg, from Siberia (Tschuja, Altai), and from Sweden (Torneo and Karesuando in Lapland), partly in forms strictly intermediate, partly in other

forms which approach either *B. alba* or *B. nana*. Dr. Regel also states that Koch considered some of the described forms as *B. intermedia*, Thomas, between which also really intermediate forms are found, which show their origin, since the fertile hybrid in the next generations more or less quickly revert to one of the ancestors. There does not appear to have been published any notice of hybrids of *Betula* in North America, and this note is to record some apparent hybrids between the shrubby *B. pumila* and *B. lenta*, the Black or Cherry Birch, which becomes one of our fine trees.

Betula lenta is an abundant native tree in the Arnold Arboretum and adjacent country, but *B. pumila* is rare in eastern Massachusetts. It has, however, been freely introduced into the Arboretum by seed collected in other parts of New England.

From a vigorous plant of this Dwarf Birch, which was growing about one hundred paces to the east of a number of healthy, well-grown trees of *Betula lenta*, a large quantity of seed was collected in the autumn of 1887. This was sown in January, 1888, and resulted in several thousand seedling plants. As these grew, a large number were disposed of or destroyed. Out of several hundred plants which have been kept to maturity half a dozen individuals show distinct characters, indicating hybridity with *B. lenta*, the only species growing in the vicinity and the pollen of which would be directly blown to the seed-plant by the prevailing westerly winds.

The very short, erect, usually solitary and axillary catkins of flowers of *Betula pumila*, the short fruits, not often over half an inch long and generally much less, and the bluntly dentate, generally obovate or rounded leaves, which hardly average more than an inch in length, are in striking contrast to the large terminal staminate aments of *B. lenta*, to the long aments of the fertile flowers, the thick fruits, often nearly an inch in length, and the large, long-pointed, sharply serrated leaves. Moreover, the Dwarf Birch is always a slender shrub, from two or three to seven or eight feet high, while our Black Birch is one of our finest trees of the genus.

All of the hybrids noticed show a distinctly different growth in comparison with the *Betula pumila* among which they are growing. They are mostly more vigorous in stem and branch, becoming taller and larger bushes, and one or two may develop an arborescent character, although they already flower and fruit freely, as several of the hybrids have done for two or three years.

Four of the hybrids possess very distinctly the pleasant aromatic flavor and fragrance which is so characteristic of the twigs and inner bark of the Black Birch, the degree of the aromatic quality varying in different individuals of the hybrids, although it is not quite so rich in any of them as in the typical Black Birch, while two of the hybrids have little or none of the aromatic principle, in this respect agreeing with *Betula pumila*.

The leaves of all the aromatic hybrids are intermediate in size between the typical leaves of the parents, but by their lustre, general ovate form and the unequal sharp serrations of the margins they have more resemblance to *Betula lenta* than to *B. pumila*. In the blossoming and fruiting the specimens are also intermediate. In some the sterile catkins are terminal, as in *B. lenta*, although hardly a third the length of those of this species; in others the sterile catkins are axillary and below the fertile flowers, in this resembling *B. pumila*, although two or three times as long, and becoming recurved or pendulous as they elongate. At flowering the intermediate condition is very apparent, and it shows itself even in the winter buds. In the fruitage a very marked variation is shown in general size and form, and the scales show intermediate states between the heavy three-lobed scales of *B. lenta* and the lighter, more deeply cleft scales of *B. pumila*.

By the color of their twigs, absence of aromatic quality, the obovate tendency in the shape of many of the leaves, their blunter, more angular dentation and paler color be-

neath, two of the hybrids show a closer relation to *Betula pumila* than to *B. lenta*. They differ from *B. pumila*, however, by the greater vigor and larger size of the plants, the much larger fruits, the larger leaves, which are more generally ovate than in *B. pumila*, with teeth more inclined to be sharply serrate than angularly dentate.

Whether any of these hybrids would reproduce themselves in many individuals by sowing the pure seed is a matter for further experiment. The present instance seems to show how freely the Birches may hybridize with each other when two or more species are growing near together and flowering at about the same time. But, when growing naturally, although many ovules might be fertilized by pollen from another species, it would be a rare case that one of the perfected seeds should develop into a mature plant, as not one seed in tens of thousands gets a chance to grow. On the other hand, under conditions of artificial propagation and cultivation, a large proportion of the seeds sown are expected to develop into plants, and it is under these circumstances that the fact of the frequency of hybridity becomes apparent. It is made especially clear when it occurs among such dissimilar species as *Betula pumila* and *B. lenta*, where the intermediates are so distinct that hasty students might be led to give them new specific names. It may be worth mentioning that Mr. C. E. Faxon and other botanists have found in various parts of New England what appear to be undoubted hybrids between *B. papyrifera* and *B. populifolia*.

The drawing prepared by Mr. C. E. Faxon represents the character of the flowering of one of the hybrids between *Betula pumila* and *B. lenta*, the appearance of the foliage and fruit of another, an enlarged scale and nutlet from the fruit, a typical leaf of *B. lenta* and one of *B. pumila*, the latter being somewhat larger than the average.

Arnold Arboretum.

J. G. Jack.

Entomological.

New Facts about Scale Insects.—I.

JUST now the study of scale insects and mealy bugs, *Coccidae*, is progressing more rapidly than ever before; and, perhaps, more than at any previous time, horticulturists are awakening to the importance of this subject in its relation to their industry. Last year (1894) nine authors described between them forty-two new species of *Coccidae*. This year there will be more writers, and the amount of work published will be very much greater. Mr. E. E. Green, of Ceylon, will alone publish over forty species; Mr. Maskell has a paper now in press, doubtless containing a great deal that is new; I have nearly forty species awaiting publication. Very probably the *Coccidae* described in 1895 will not fall short of 150, a very much greater number than heretofore described in any single year. The total number of *Coccidae* so far published is only about 750. Of these, it may be remarked, about 175 are to be credited to Mr. Maskell.

It is singular how easily a species may be overlooked. Most *Coccids* are inconspicuous; but, what is more curious, they are so often extremely local in their distribution, even where the food-plants abound. *Atriplex canescens* is one of the commonest plants found at Las Cruces, New Mexico. Two days ago I noticed, on my way home from the Agricultural College, a plant more or less covered by what looked like the seeds of *Phoradendron*, so often seen on trees about here. Hesitating a little as to the actual nature of the appearance, I stooped and picked a twig. To my astonishment the apparent seeds were specimens of a new and very remarkable *Coccid*. Though numerous on this particular plant, it had never been seen on the *Atriplex* growing all round the locality, which I had often examined; and what is more, I had passed this very plant on my way to and from college ever since the middle of 1893, and had seen nothing.

The creature is so peculiar that I thought it would form

a new genus; but for the present it may be better placed in *Eriococcus* as *E. neglectus*, n. sp.

Last week I spent part of two days at the Dripping Spring, in the Organ Mountains, near here, about 5,600 feet altitude (1,800 feet higher than Las Cruces). On the wild Oaks I found two species new to the locality—*Kermes galliformis*, Riley, which seems to be very widely distributed in the United States, and *Chionaspis Quercus*, Comst., hitherto known only from California. The latter appeared to have killed many of the twigs and smaller branches, and would, doubtless, be a very troublesome pest on Oaks cultivated for ornament, should it get taken east. Sitting down to rest after climbing a few hundred feet above the camp, my eye fell casually on an *Opuntia* (which Professor Wooton tells me is *O. Engelmanni*). Some white spots on it suggested a closer inspection, and proved to be *Diaspis Cacti*, Comstock. Now, why should this scale be found up there on a single Cactus-plant, and not be observed anywhere else in the vicinity or in the valley below, though species of *Opuntia* abound? This *D. Cacti* was described from specimens causing serious trouble on cultivated *Opuntia*-plants in the east, and its native habitat was unknown until Professor Toumey lately found it plentifully in Arizona.

I have been making an effort to find out what *Coccids* exist on Palms throughout the American tropics, and to that end addressed letters to a number of consuls in localities whence no *Coccids* had hitherto come. So far two replies, with specimens, have come in. A piece of Palm-leaf from Mr. J. D. Hall, United States Consul at San Juan, Porto Rico, is very sparsely infested with *Aspidiotus destructor*, Signoret. Mr. Hall explains that the Palm was a young Cocoanut in cultivation. Mr. F. Wolff, Acting German Consul at Jacmel, Hayti, was very obliging, and sent portions of leaves of *Oreodoxa regia* and *Cocos nucifera*. Both were sparsely infested by a single species, *Aspidiotus Ficus*, Ashmead, which is new to Hayti.

The California people ought to be much obliged to Mr. Craw for the way he is heading off troublesome *Coccids* about to be introduced into that state. Mr. Ehrhorn sent me the other day the following species, lately found by Mr. Craw in his quarantine work: *Ceroplastes rubens*, Maskell, on a Fern from Honolulu; *C. ceriferus*, Anders., on *Camellia* from Japan; *Chionaspis biclavis*, Comst., on Orange from Tahiti; *Asterolecanium pustulans*, Ckll., var., an unknown shrub from Mexico. The last is a particularly pernicious species.

New Mexico Agricul't Experiment Station.

T. D. A. Cockerell.

Plant Notes.

Viburnum cassinoides.

SOMETHING like a dozen species of *Viburnum* are natives of eastern North America, and all of them are such good garden plants that we make no apology for repeating what we have said in their commendation year after year ever since this paper was founded. Like our native *Cornels*, their worth has never been thoroughly appreciated by planters, and there are many large collections of shrubs in public and private grounds of this country in which hardly a representative of either of these interesting genera can be found. The *Viburnums* are very beautiful when growing wild, and sometimes they display their best points on the wood borders, but in order to realize all their good qualities one has to see well-established plants after careful cultivation in good soil. These plants in masses and in single specimens make one of the most useful object-lessons which the Arnold Arboretum is furnishing to its thousands of visitors every year. Our native shrubs have here been planted so abundantly that their good and bad qualities are evident to any one who cares to study them. *V. cassinoides*, as seen in the garden, is certainly very different from the spindly plants which are usually found wild in swamps. In rich ground

it spreads out into a broad round-headed shrub, with large, handsome, bright green and nearly entire leaves, and in early June the plants are covered with broad cymes of cream-white blossoms. It would be difficult to improve these plants in their general character, and yet, no doubt, under cultivation they will develop many minor differences of

a height of ten feet and an equal breadth. In early autumn its ripening berries turn to a bright pink or flesh color, and later on become almost black, with a blue bloom, and the deep green foliage changes to purple or to a deep claret color.

Viburnum nudum, a more southern plant, closely resem-

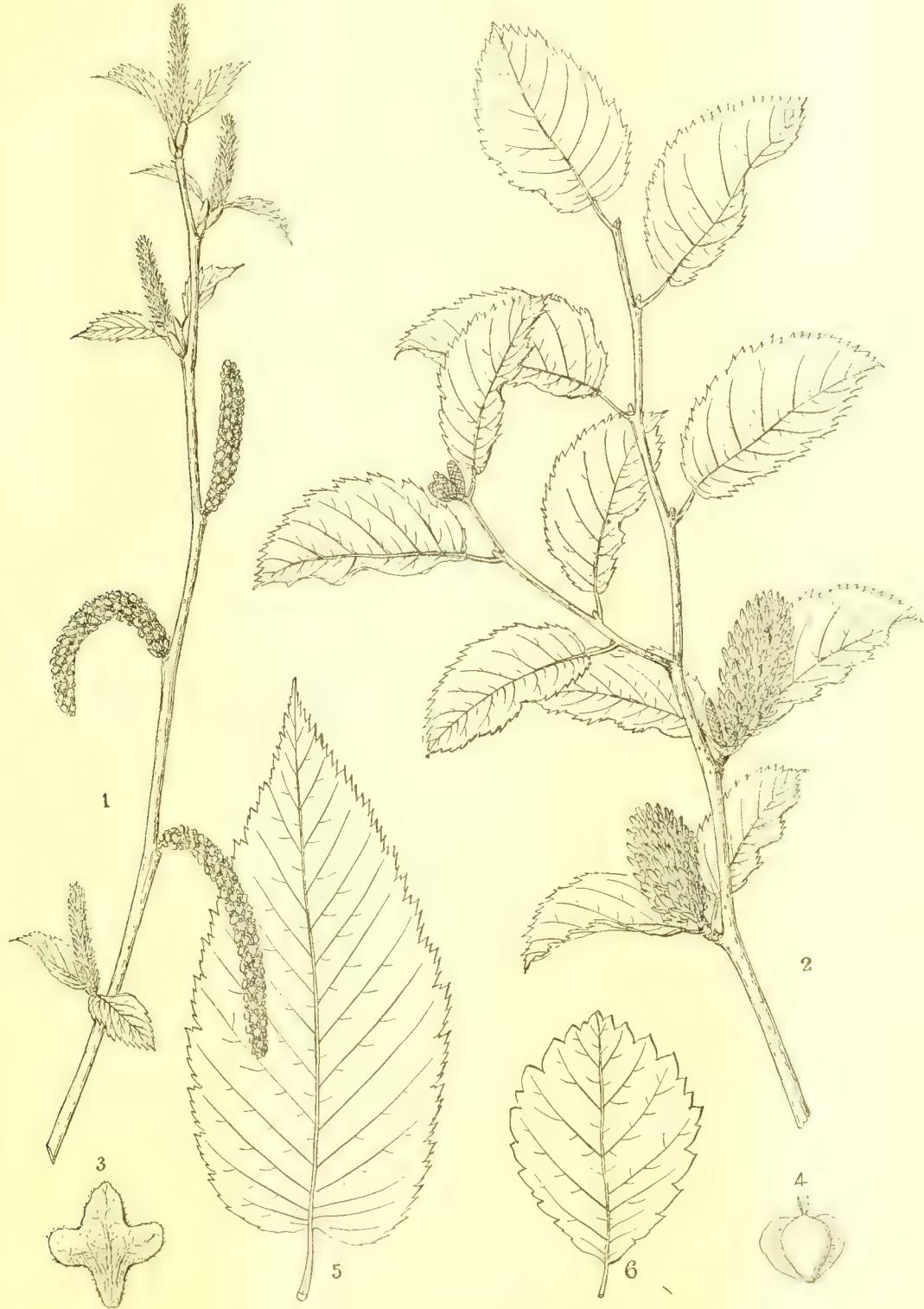


Fig. 36.—*Betula pumila* × *lenta*.—See page 243.

1. Flowering hybrid. 2. Fruiting hybrid. 3. Scale of fruit. 4. Nutlet. 5. Leaf of *Betula lenta*. 6. Leaf of *Betula pumila*.

form. We observed last week that among a dozen of them, standing in a group, the flower-cymes of one were much broader than those of the average and were elevated in the centre, so that they assumed an almost hemispherical form. Under good cultivation *V. cassinoides* will probably reach

bles this, although its leaves are thicker and rather more lustrous. *V. acerifolium* is a somewhat smaller plant, with Maple-shaped leaves, which turn in autumn to a bright scarlet, and it flowers at the same time with *V. cassinoides*. We have no space here to mention *V. Lentago*, the Sheep

Berry, with large, handsome leaves, which has just passed out of flower, or *V. prunifolium*, the Black Haw, which is closely allied to it botanically, although it has handsomer flowers and more shining fruit. *V. dentatum*, the Arrow Wood, and *V. pubescens* are both admirable plants when cultivated in deep soil, valuable both for their flowers, their ornamental fruit, their habit and the beauty of their autumn foliage. *V. lantanoides*, the Hobble-bush, is the most showy of all the species in flower, and when grafted on the European *V. Lantana* is less difficult to cultivate than when grown on its own roots. *V. Opulus*, the Cranberry Tree, is found in all the temperate regions of the northern hemisphere, and plants in the Arnold Arboretum, raised from seed sent from northern China, seem much more beautiful in flower than either the North American or the European forms, the sterile ray flowers being twice as large and rather more than an inch across. Taken altogether, these Viburnums are among the very best of hardy shrubs and are adapted to almost every condition and use.

ONCIDIUM HEMATOCHILUM.—This Orchid, which has always been rare in Europe, and is becoming more rare, has had something of a confused history, and, therefore, a letter by Mr. Thomas T. Potter in *The Orchid Review* is interesting, as it suggests the probable origin of the plant. Mr. Potter says it is found sparingly in one limited district in the island of Trinidad. *Oncidium Lanceanum* is only found in the same region, and *O. luridum* also abounds there. Since the flower of *O. hæmatochilum* is intermediate between those of the two species named above, and they often grow close to each other and flower at the same season of the year, Mr. Potter suggests that it is a natural hybrid between them. Experiments have been made by crossing *O. luridum* and *O. Lanceanum* to see if the offspring will prove to be *O. hæmatochilum*. The editor of *The Review* suggests that in view of the rarity and beauty of the supposed hybrid that growers would do well to try additional crosses in the hopes of raising valuable seedlings.

INCARVILLEA DELAVAYI.—We had one or two notices of this plant last year, and it has special interest from the fact that it may prove hardy in this country from Washington southward, and, perhaps, from a still higher latitude. Mr. Watson writes that it is now flowering in a greenhouse at Kew, and proves to be a distinctly beautiful pot-plant, with fleshy green pinnatipartite leaves, something like those of *Tecoma grandiflora*, and erect scapes a foot long bearing a raceme of large rose-colored flowers with a yellow blotch inside the tube. It may be called a glorified *Amphicome Emodi*, to which it is nearly allied, but it is a much more striking plant. The root-stock is perennial, but the leaves are annual. Grown in a six-inch pot in a cool greenhouse it is quite at home. It is one of the many beautiful and interesting Chinese plants that we owe to the French missionaries. For its possession we are indebted to Messrs. Vilmorin & Co., Paris, who distributed it in 1893.

HELENIUM HOOPESII.—This is one of the earliest of our hardy composite plants to flower, but earliness is not its only merit. Some of the *Heleniums* are in flower during the entire season, from late May until *H. autumnale* is killed by frost. But *H. Hoopesii* is, perhaps, the showiest of all, with its bright orange-yellow ray-flowers, and its disk of almost exactly the same tint. These flowers are borne on long stems, the plants being two feet high or more, and they are quite as useful for cutting as for the decoration of the hardy plant border at a season when flowers of this color are rare. *H. Hoopesii* will flower from seed the second year, and, like other related plants, it will flower better if not disturbed too often. It is perfectly hardy and easy to manage, although Mr. Orpet finds that a white aphid sometimes attacks its roots. If a plant begins to look unthrifty its roots should be examined, and if the aphid is discovered it should be lifted and transplanted into fresh soil after the roots have been washed with an insecticide.

Cultural Department.

The Russian Tree Fruits in America.—III.

NOT until since the return of the Budd-Gibb expedition from Russia in 1882 did American fruit-growers reach any adequate appreciation of the pomological wealth of that portion of the world, and still less did we realize the benefits to arise to so large a section of northern America from the introduction of these fruits to this continent. The apple, it is true, is our most important tree fruit; but very clearly is it a boon of no small importance that the cold north should have added to its possessions the Pears, the Plums and the Cherries of Russia, proving, as they have now done, beyond a doubt, perfectly adapted to its climatic conditions, and that they are in no way inferior to the older standards as regards vigor, productiveness and quality.

Now that my trees have come into nearly full bearing, and have by so many years' test shown their quality and their evident market value, I stand amazed at the change which must quickly follow in so large an area of territory, where there has heretofore existed not so much as a feeble hope that we should ever find ourselves free from dependence in this respect upon lower latitudes. My own delight and astonishment, reflected in the eyes of my neighbors, when they begin to realize that these fruits may be so easily home-grown, might by strangers be regarded as almost pathetic. Living so long without expectation of any great advance in this direction, it seems as though we had been transported to a new country. But this time the mountain has truly come to the prophet. There is clearly nothing to hinder the free and unbounded production of these Pears and these stone fruits throughout a belt of some three hundred miles in width of country where hitherto it has been doubtful whether the Apple could be made a real and permanent success. It is as though a race of Orange and Lemon trees had been found which could be successfully grown in Virginia.

And these fruits are not of any stinted or inferior growth or quality—mere makeshifts for something better. Each season reveals, as variety after variety comes into full bearing, the unmistakable fact that our section has been provided with a race of orchard fruits which may not only reasonably be expected to well supply our home markets, but also to find their way into all markets in rivalry with anything known in the same line. If these fruits will do as well farther south as they do with us—which may, perhaps, be doubted—they might bid fair to replace them in many localities. This is more particularly true of the stone fruits. As to the Pears, only a few varieties have yet come fully enough into bearing to enable us to see whether they can so fully replace the fine varieties, and especially the keeping varieties, of a lower latitude.

Newport, Vt.

T. H. Hoskins.

Irises.

NOW that the hybrid German Irises are waning, it is a convenient period for reviewing the season, although it is true that some of the most showy ones have yet to bloom. We have yet to see most attractive displays of the bulbous Spanish and English kinds, and the Japanese varieties, which later on end the season for the more showy garden kinds. In spite of the long-continued cold weather of last winter there were few losses among Irises, except of a few kinds whose cultivation in the open is always precarious, except under special protection. This includes those species which make early or winter leaf-growth, and among them are some of the reticulata section, the *Oncocyclus* and the Spanish Irises, *I. tuberosa* and the African bulbous species. Except the latter, which can scarcely be flowered here, except as frame plants, these Irises, which are perfectly hardy, do not usually suffer much, if any, damage in winters when the temperature makes a sudden drop to minus degrees. But last winter the temperature kept at this point for a number of days and nights in succession. This severity proved fatal to foliage which had been made mostly at the end of the year. Plants which make only scant foliage, as do these Irises, are badly set back when their foliage is destroyed, and do not seem to be able to flower, though the bulbs are usually found to be perfectly sound. It seems rather curious that they should not bloom, as the flower is, of course, formed in the bulb, and the leaves in many cases are so slight as apparently to be of little service; however, it is probable that these are adapted to the work to be done in perfecting growth, and that their loss is a fatal check. Some *Calochorti* were affected in the same way by the same conditions. Plants of *C. Kennedyii*, which were quite forward in leaf on January 1st, lost their leaves and failed to move after-

wards, though the bulbs, taken up a few days since, are sound and hard. This observation is offered, however, only as a tentative one, for it does not answer to come to hasty conclusions in garden matters.

Few persons care to grow plants in the garden in the inclement season, but to those whose gardening fever braves all the elements, the early bulbous Irises are fascinating subjects. The choicest of these early kinds for the garden are *I. Bakeriana*, *I. histrioides* and good forms of *I. reticulata*, all of which are hardy, except *I. histrio*. *I. Rosenbachiana*, of about the same period, is particularly beautiful and desirable, and this is soon followed by *I. orchioides*, which, with its distinct habit and numerous golden-yellow flowers, should be in every garden. It is not plentiful yet, but seeds freely, and should even be more widely grown. This will scarcely fade before the dwarf rhizomatous Irises brighten the border, though with quieter tints. *I. pumila*, purple, and its white variety are both attractive and thrifty plants. Slightly taller and a little later in appearing are *I. Chamæiris*, lemon-yellow, and *I. Olbiensis*, purple. There are numerous species of similar habit, flowering time and height, but these are easily available and as satisfactory as any of the class. A little later there is a wealth of flower in many species, all more or less interesting. *I. Statellæ* is, perhaps, the best of the nearly white kinds of the period; it is a lovely flower and free-blooming. Soon the hybrid German Irises are in flower, and however much interest there may be in the species with their various habits, different forms and colorings, there is no time at which a garden of Irises is so gay and charming as when a good selection of hybrid Germans are in full bloom. Former notes in GARDEN AND FOREST have given, somewhat in detail, the parentage and range of coloring of these hybrids, and it will suffice to say here that a good collection will comprise those with yellow standards of various shades, and brown or reddish brown falls, the light lavender kinds, the purples of varied hues, those with white standards and falls lined with blue markings; those with pink flowers. With these one can scarcely go amiss, and there are also very quaint cuir colorings, sometimes with old rose, shadings which are pretty. Those with smoky colorings are odd, but less desirable, while hybrids of *I. sambucina* and *I. squalens* touch the extreme of ugliness. These are mostly dull flowers with linings of rusty purple on a dull white ground, and purplish red falls. The collection should also contain the old purple early-flowering *I. Germanica* common to gardens, and the white kind which seems to do duty variously as *I. Germanica alba*, *I. Florentina*, etc., but is really a form of *I. albicans*. This Iris is of a rather slaty white, but very handsome, free and decorative. It has a somewhat heavy, but not unpleasant, odor in close quarters. A pure white form of this Iris is one of the handsomest of all Irises, but is rather uncommon. If one were forced to choose one Iris of a purple tint it should be the Dalmatian form of *I. pallida*, a plant with bold foliage, stems three to four feet tall, and striking flowers of a light purple tint which remind one in odor of the Locust-flowers. This plant in full flower has an air of distinction and is most effective. There are others, of course, an almost endless list, and not to carry the reader too far afield this list may conclude with only one more kind, a common one, which always excites enthusiasm. In a wet or dry place, *I. Pseudacorus*, its graceful flowers with modestly drooping petals and cheerful golden-yellow tint, is one of the many plants of which one can only say nothing could be more beautiful.

As these rhizomatous Irises now go out of flower, it is the best time to move them and secure the kinds desired. They soon commence to make a new growth, and ordinarily will become well established before winter, and will flower next year. They thrive in good garden-soil. It is well to raise the beds slightly and to plant the rhizomes near the surface. After planting and watering once to settle the earth, it is well to withhold water until they have commenced to grow, to avoid any risk of rotting. These Irises are very tenacious of life, and often seemingly hopeless dried rhizomes may be coaxed into growth by planting them where there is no chance of forcing with extra moisture and warmth. If the rhizomes are covered with standing water or decaying vegetation they sometimes rot, but, as a rule, they pass the winters without harm. Some of the Irises like *I. Pseudacorus* and *I. versicolor*, however, are equally adapted to wet and dry conditions, and such things defy any cultural rules. They grow wherever they happen to be located—that is, they do so in my garden, and I suppose in a large majority of gardens, yet for a foreign friend, a skillful grower of Irises, our common Flag will not grow at all. These different experiences with plants are one of the things which make gardening so intensely interesting.

Elizabeth, N. J.

J. N. Gerard.

Notes on Chrysanthemums.

CHRYSANthemum plants intended for specimen flowers should now be ready for another shift. There is a difference of opinion whether it is better to plant in solid beds, on which the root area is unlimited, or on benches, where six, or even a less number of inches, is allowed. In solid beds there is always more danger from overwatering, and if the subsoil is moist it will be difficult to ripen the growth well in the autumn, a condition most essential to insure firm and well-colored flowers. In the bench system the danger from overwatering is much less, and for this reason, if for no other, the plan is more satisfactory, especially for the inexperienced cultivator. It is certainly easier to mature the growth in the autumn.

Ten inches apart is not too much to allow if exhibition flowers are to be grown, but for general decorative purposes eight inches will afford room enough. When the heights and colors are known, a very good effect can be made in the arrangement. In planting, care must be taken to make the soil firm about the plants, so that no air-spaces are left. It must not, however, be packed solid. The whole bed must be left open enough for air and water to pass through easily. Water should be given quite sparingly until some growth is made, and not in large quantities until the plants are growing vigorously.

In many private places, where the convenience for benching is limited, good blooms may be grown in seven or eight inch pots, the size being regulated by the vigor of the variety, as far as known, but it can generally be assumed that a strong-growing plant in a small pot will continue to grow on in a larger one. The plants can be carried through the intermediate stage by shifting from a three to a five inch pot, but with care in watering this is not really necessary. When larger pots are used they should be filled little more than two-thirds full of soil, enough room being left for one or two top-dressings of good loam. As recommended for plants when benched, water must be given sparingly until the plants are well rooted, but they may be syringed liberally on all bright days throughout the season. Generally, on the bench system, one bloom only is allowed, but in pots the English plan of allowing two or three blooms can be followed successfully, since by shifting the plants it is easy to give room for fuller development.

From my experience, more satisfactory results come when the plants are grown in a well-aired greenhouse. Outdoor culture is almost impossible with so many insect foes. The tarnished plant bug may sap the life out of a promising shoot and spoil a whole season's labor in one day. Under cover the house can be closed and fumigated every week or two, and this danger thus reduced to a minimum.

Wellesley, Mass.

T. D. Hatfield.

Gloxiniias.

THESE beautiful greenhouse plants have not been left behind in the general improvement which has taken place in what are called florists' flowers. The best forms we now see are principally from *Gloxinia*, or, more correctly, *Sinningia speciosa*, a native of South America. Gloxinias are most useful as pot-plants, the flowers, from their soft nature, being of comparatively little use for cutting. To grow them perfectly they must have a warm temperature, be shaded from the sun, and the atmosphere must be kept rather moist. They do well in a mixture consisting of equal parts of loam and leaf-mold, with the addition of some rough sand and well-decayed cow-manure. The latter should be dried and put through a quarter-inch sieve before being mixed with the other ingredients. In starting the roots I prefer to put them into as small-sized pots as possible. After the plants make a few leaves they should be shifted into the sizes in which they are to bloom. The soil should be packed quite firmly, with plenty of room for water, of which the plants need large quantities when growing. While growing the plants should be syringed frequently, and as they approach the flowering stage the atmosphere may be kept less moist. When in bloom water should never touch the flowers, and if syringing has to be done in the house for the benefit of other plants, the Gloxinias in bloom should be removed to a place where the water will not reach them. When about to bloom a little weak liquid-manure applied occasionally will be found to be helpful. It is a simple matter to have Gloxinias in bloom early in the spring and until late in the fall. For early blooming the old roots should be started in heat, and a portion kept in a dry well-aired house to be started later on. For blooming in the late summer months and in the fall, seedlings which are raised early in the year must be depended upon. These should be grown on gradually until they are in four and five inch pots. The roots from these seedlings make

excellent plants for the next season's use. In storing the plants for winter the pots containing the roots should be laid on their sides on the floor of a temperate house, where they will keep moderately dry.

Gloxinias may be propagated in various ways. When more than one growth appears on a crown the extra ones can be taken off and rooted, and these growths make almost as good plants as those from which they were taken. Another method, and probably the best one, is to take the mature leaves, with pieces of the stalks attached, and place the under surfaces downward in boxes of clean sharp sand. The stalks of the leaves should be inserted in the sand, and the midrib of each leaf may be cut transversely two or three times. At each of these cuts and at the end of the stalk little bulbs will form, but no leaves will appear on them during the first season. As soon as the old leaves shrivel up these little bulbs should be collected and stored in dry sand until they are wanted the following spring. These two methods of propagation are the best for the perpetuation of good varieties. Raising plants from seed is an operation which requires great care, as the plants in the seedling stage are very easily ruined by too much or too little water.

Botanic Garden, Washington.

G. W. O.

Correspondence.

Peach-growing in Georgia.

To the Editor of GARDEN AND FOREST:

Sir.—A few weeks ago, when in the Georgia fruit-belt, some of the early varieties of Peaches were just beginning to show a faint blush, but the season this year is at least two weeks later than usual. Many growers expected to ship peaches by the first of June, but it is doubtful if mature Georgia peaches will be seen in northern markets this year before the middle of June.

The sudden rise and growth of the Georgia Peach-belt is one of the most interesting facts in the recent history of fruit-culture. The crop from Georgia now rules the markets until the Delaware crop comes. It is less than ten years since the first large shipment of peaches was made from Georgia to northern markets, and yet within this time the Georgia peach has obtained as wide a reputation as the Georgia watermelon. There are several Peach-growing sections in the state, but the most extensive orchards are located in Houston and Macon Counties, in middle Georgia. The Rumph Peach orchard at Marshallville is said to be the largest one in the state. It contains about 94,000 trees, and when in full blossom it is worth going miles to see.

There is now a boom in peach-growing in Georgia. The profits of some fortunate growers have tempted hundreds of people to go into the fruit business, and it is estimated that 1,000,000 Peach-trees have been planted in the past two or three years in the Peach-belt alone. Meanwhile, the rage for fruit-growing, especially peaches, has spread with great rapidity in other sections of the state. There is now a regular fruit-belt extending directly south from Macon one hundred and fifty miles. It follows in the main the line of the Georgia Southern and Florida Railroad. A few years ago this region was a tract of timber-land, and in this stretch of one hundred and fifty miles it is doubtful if 3,000 acres were cleared and used for agricultural purposes. Inhabited by lumbermen and turpentine workers, this whole area was regarded as worthless for fruit-growing or for farming.

Now, if you visit the country from Macon to Valdosta you will find the landscape dotted with orchard after orchard. There are also several thousand acres of vineyards in this section. It is estimated that 500,000 Peach-trees have been set out at various points along the Georgia Southern and Florida Railroad within the past three or four years. Orchards covering one hundred acres are not uncommon, and those who make peaches their chief crop have from 20,000 to 80,000 trees. Some of the large Peach orchards in this section are the Elberta Orchard Company, at Avondale, with 40,000 Peach-trees; the Oak Ridge Fruit Company, at Kathleen, has 30,000 trees; the Tivoli Fruit Company, at Tivoli, has 80,000 trees; the Model Farm, at Cyclonetta, has 40,000 trees; at Tifton there are the orchards of the Tift Fruit Company, containing 45,000 trees, of H. H. and W. O. Tift, containing 10,000 trees, and the W. O. Tift orchard of 20,000 trees.

The Model Farm at Cyclonetta, which comprises about 1,200 acres, has, besides 40,000 Peach-trees, 5,000 Pear-trees and a vineyard of 10,000 vines. There is an experimental station at this place, and many systematic tests have been made with the soil in order to show its qualities. Mr. D. G.

Irby, manager of the farm, states that results demonstrate that the chocolate soil of Georgia has valuable properties that have not generally been understood. This chocolate color is a familiar sight all the way from Macon to Valdosta. It is a loam with a red clay subsoil; it is easily worked, and the subsoil seems to hold moisture for a long time. Some fertilizers are used which contain potash and phosphate. Most of the nitrogen is supplied cheaply by growing leguminous crops, such as Clover, Peas, etc. In the southern part of the state the soil is sandy, and requires more care.

The varieties of Peaches grown in the Georgia orchards, and the order in which they are shipped to market, are Alexander, Waterloo and Shumaker, about June 1st; Early Rivers, Tillotson, Mountain Rose and Lady Ingold, from the 10th to 25th of June; Early Crawford, Elberta, Stump the World and Diamond, from the 15th of July to August 1st; the late Crawfords last till August 15th.

The Elberta is now the favorite variety. More trees of this variety have been set out within the last three or four years than of all other kinds together. The Elberta is a large handsome peach with dark red cheeks. It has a fine flavor, and arrives in market in good condition.

The growing of peaches in Georgia has been at times so profitable that northern capital has been attracted to the industry. In fact, some of the largest orchards in the state are owned by northern people. Many stories are current concerning the fortunes made in peach-growing, and some of these must be taken with a grain of allowance. One company which controls a Peach-orchard of 200 acres is said to have cleared, two years ago, \$150 net per acre, or \$30,000. Another company is supposed to have done just as well from an orchard of 350 acres. The small growers of peaches make money in good seasons. One grower from Ohio with ten acres told me that he sold his crop two years ago on the tree for \$2,000.

The early Georgia peaches reach northern markets when prices are the highest. They come just before the California peaches arrive by the car-loads, and the Georgia growers have the advantage of being much nearer to market than their western competitors. They claim that their fruit is superior in quality to the California product. The prices realized range from fifty cents to one dollar per crate of three pecks, while later on in the season the markets often become glutted, and peaches sell as low as fifteen and twenty cents a basket. The owners of Peach-orchards in Georgia are fearful of the yellows, which has ruined the trees in other Peach districts, but thus far they have escaped any serious damage.

New York.

L. J. Vance.

Western New York Notes.

To the Editor of GARDEN AND FOREST:

Sir.—The state of New York has long been famous for its apples. There is no well-defined Apple-belt in its western counties, the orchards being scattered over the entire area upon almost every farm. The most continuous and important plantings, however, lie in a long area upon the north, running nearly parallel with the general direction of Lake Ontario. This belt comprises the greater part of the counties of Wayne—beginning at the east—Monroe, Orleans and Niagara. One traverses these orchard areas if he passes over the Niagara Falls Division of the New York Central Railroad from the Falls to Rochester, over the main line of the Central from Rochester to Syracuse, and, nearer the Lake, if he rides over the Rome, Watertown & Ogdensburg Railroad from Niagara Falls to Syracuse. The traveler will probably be more impressed with the extent of the orchard-planting by taking the first of the routes here mentioned, from Niagara Falls to Rochester. There are also very large Apple areas in Ontario, Seneca and Cayuga Counties, an area which one crosses upon the Auburn Division of the Central Railroad from Rochester to Syracuse, passing through Canandaigua and Geneva.

These Apple-lands have been very profitable, as a rule, until within the past few years. In fact, apples have been the leading "money crop" in a large part of western New York. "A crop of apples is like a gift," an old farmer in Orleans County said to me a few days ago. There is more meaning in this remark than he intended. It really explains, to my mind, the chief cause of the recent failures of the crop. If a thing is a gift, there has necessarily been no effort expended to secure it. The fact is that the greater part of the Apple-lands of western New York have been cropped with hay or other things from the time the orchards were set, and very little plant-food has been returned to the soil. The system of cultivation—the growing of grass and sowed crops—is also the one which is

least efficacious in ameliorating the soil itself and in preserving its moisture. As a rule, the orchardists have taken pride in their pruning and in their general care of the trees, but the soil treatment, in reference to tree-growing, has been much neglected. I imagine that much of this attitude of mind has been brought about by the habit of nearly all horticultural writings of treating of the plant first, with only incidental reference to the soil. Books are full of good advice in regard to planting, pruning, grafting, varieties and the like, but where is the book which instructs the orchardist in detail how to till and fertilize his soil?

The orchards of western New York, therefore, are beautiful to look upon, but they are rapidly coming to that point where the expenditure of capital equals the deposit in the bank. I have been apprehensive that the vigorous and necessary campaign of spraying may still further obscure the importance of the fundamental treatment of the land; but the extent to which the old orchards are being plowed and cultivated this year is encouraging.

Cornell University.

L. H. Bailey.

Poison Ivy.

To the Editor of GARDEN AND FOREST:

Sir,—I have been interested in the subject of the comparative virulence of *Rhus toxicodendron* at different seasons, as discussed in your paper. An acquaintance of mine was severely poisoned by it this spring in March, before any leaves appeared, although he had handled it many times before at this season without being affected. Three years ago he was poisoned in midsummer. Now, it is well known that persons can contract contagious diseases on seemingly slight exposure under some conditions, although with more complete exposure on previous occasions the disease had not been transmitted. Is it unreasonable to suppose that the physical condition of the patient in some measure limits or increases the poisonous qualities of the *Rhus* more than the season of the year?

B. L. Putnam.

Harmonsburg, Pa.

Nymphaea Laydeckeri rosea.

To the Editor of GARDEN AND FOREST:

Sir,—There seems to be a general misunderstanding about the origin and habits of this plant. It is not the result of the direct hybridization of *Nymphaea pygmæa* or of *N. alba*, var. *rosea*. On the contrary, it comes from seed of the variety *N. Laydeckeri rubra punctata*, which latter plant is a cross in which the pollen parent is *N. rubra*, of India. *N. Marliacea flammea* has the same parentage, and when Mr. Marliac had produced these two plants they were named by Monsieur M. L. de Vilmorin as above.

Nymphaea Laydeckeri rubra punctata produces flowers as large as those of *N. odorata* *rosea*, and of a vivid carmine color. The plant gives no offsets from the rhizome, but makes up for this lapse by bearing abundantly fertile seeds from which comes the elusive *N. Laydeckeri* *rosea*. Mr. Marliac has never sold the goose which lays his golden eggs, and thus easily keeps a corner in the market for *N. Laydeckeri* *rosea*. No doubt, expert horticulturists may succeed in obtaining valuable results by hybridizing in the hopes of obtaining duplicates of this plant, but they will probably not get the real plant in this way, nor can they secure stock by murderously cutting in pieces an imported plant of the same.

R. H. Faunce.

Sandwich, Mass.

For the Rock-garden.

To the Editor of GARDEN AND FOREST:

Sir,—A gay little group in the rockery for early spring is made by the low-growing *Saponaria ocymoides*, which we have already described, with its bright pink blossoms, the *Achillea tomentosa*, with its sunny yellow flowers, and the white, hardy Candytuft, all of which are in full bloom in the middle of May. Wild Geraniums are easily naturalized, and they bloom in company with the early Larkspur, *Delphinium tricorne*, whose blossoms of deep indigo-blue are very attractive. Both of these plants are natives of our woods. *Veronica amethystina*, with its deep blue flowers, is also an admirable low-growing plant for the early season, and is always seen to good advantage among the hardy Candytufts. And, by the way, these Candytufts are in bloom through such a long period and their habit is so good for the purpose that they are indispensable in the rock-garden where early white flowers are needed to mingle with those of other colors.

Shepherdstown, W. Va.

Danske Dandridge.

Recent Publications.

Familiar Flowers in Field and Garden. By F. Schuyler Matthews. D. Appleton & Co., New York.

It is difficult to find any reasonable excuse for the existence of this book. It could hardly have been written for persons who have ever taken any interest in flowers, for such information as it gives is of the most superficial character. It contains little that is novel or suggestive, and it does not state well-known facts with any of the freshness and force which comes from original observation. One can conceive of a book on flowers which would be entertaining and stimulating, even if it were not dryly instructive on botanical lines, but in that case the author would need to have the gift of clear-seeing, and he should be able to describe what he sees in a sprightly way, or else he should have the power to lift his subject into the realm of poetry. But Mr. Matthews has little of the naturalist's discriminating faculty, and still less of the creative imagination; he lacks, too, a sense of humor, or he would not state his commonplaces with such circumstance and seriousness.

If the book was prepared for novices it has still less to commend it. When a reader, young or old, is to be instructed on some subject quite new to him the first essential to success is that the matter shall be systematically treated. There must be some plan of arrangement, some sequence and consistency, some central purpose or group of ideas which control the structure of the work and give it form. Mr. Matthews, however, has very little faculty for classification. His facts, such as they are, are tumbled together without any idea of their relation to each other. The only simulacrum of a plan to be found in the book is the statement that the flowers are listed according to their season of bloom. If they were arranged in the order of their first appearance this would mean something, but when we find the Chickweed and the Blue Vervain ranked in the same season together, and the Dandelion following the perennial Phlox, it can readily be seen that this arrangement means nothing at all.

Many of the drawings are excellent, but inasmuch as they are not drawn to any uniform scale, and the comparative size of picture and plant is never given, they are often quite misleading. No one can get any idea of what Pokeweed looks like from the illustration on page 236, for example. There is nothing to show that *Spiranthes cernua* is any smaller than Maxmillian's Sunflower, a page or two before it, and, indeed, there is nothing in the text to give any idea of the size or stately habit of this Sunflower.

Books written for the purpose of popularizing natural science are often useful, but when this is the case they are prepared by persons moderately well versed in the particular branch of science of which they treat. There are instructive treatises on astronomy for general readers, but they have been written by persons who know something of astronomical science. Mr. Matthews is neither a botanist nor a skilled horticulturist, and therefore he is not properly equipped to write in a thoroughly instructive way upon wild or cultivated plants. This explains why he so rarely observes the distinctive characters of different flowers and why he often falls into loose and inaccurate statements. In short, the topics of the book seem to have been selected at random—that is, there is no apparent reason why any one of the flowers chosen for description should have been selected rather than a dozen others which have been omitted. The arrangement is quite as unsystematic, and the subjects are treated without any unity of design. It is a misfortune that so many good and well-printed illustrations should not have been accompanied by a text that was more entertaining, suggestive and stimulating.

Notes.

The first Lima beans of the season are now coming from Florida, and sugar corn is also received from the same state.

An experimental plantation of trees has been made at a high altitude on the Crown Lands of Wales, under the direction of Mr. E. Stafford Howard, Her Majesty's Commissioner of Woods and Forests. If this experiment results favorably the commissioners in charge will plant trees over much larger areas in the Crown Lands, and it is supposed that landowners generally will begin extensive plantations for the improvement of their estates.

It is stated in *The Gardeners' Chronicle* that a Thuringian Rose-grower has raised a variety of the Maréchal Niel Rose whose flowers are white, excepting the inner petals, which are at first a yellowish white, and afterward a creamy white. These flowers bear some resemblance to those of Niphéos, and they have all the good points of the Maréchal Niel, including its fragrance, while the plant has handsome foliage and vigorous growth.

Mr. E. G. Hill, in the last *Florists' Exchange*, pronounces the Rose Mrs. W. C. Whitney one of the freest and most persistent of all the free-blooming Roses, giving large, bold buds of elegant finish and chaste form. The leaves are large, leathery and very glossy. He also says that Crimson Rambler has proved hardy in the trying climate of Indiana, and that it will probably come nearer to filling the glowing description of the catalogues than most of the new varieties which have been pictured for a few years past.

Mr. William Thompson, the well-known seedsman of Ipswich, England, writes to *The Garden* concerning Incarvillea Delavayi, to which plant we have referred in another column of this issue. Mr. Thompson's plant has been flowering in the open border where it has stood the brunt of the zero weather last winter. It has two stems, each of which bore twelve or thirteen flowers shaped like those of a Gloriosa, with a tube two and a half inches long and a limb two and a half inches across, being of a delicate rose or rosy pink color, with a yellow throat streaked with purple.

Vigorous efforts are now being made in Baltimore to provide the city with an art commission similar in character and responsibilities to those which have already proved so useful in other large towns. It is proposed to appoint an unpaid commission which "shall approve or disapprove designs for monuments, statues and buildings to be erected by the city," and shall consist of the Mayor and of six other members, appointed one each by the Park Commissioners, the Baltimore Architectural Club, the Maryland Historical Society, the trustees of the Johns Hopkins University, the Peabody Institute and the Maryland Institute.

About the only compensation for the destruction of Orangetrees and other tender vegetation in Florida by the freezing weather was the check it gave to certain insect pests which hitherto had been very destructive there. We read, however, in the English papers that severe frosts in that country have had a contrary effect in most cases, and that snails and ground insects have been more than ordinarily destructive. The reason of this seems to be that many of the insect-eating birds which helped to keep these pests in check by feeding in early spring and through the winter in open weather on snails and the eggs of insects were also killed. A great many of our own birds which pass their winters in the middle states were also killed, and it is not improbable that their loss will be felt in the increase of insects injurious to vegetation.

A year ago we gave an account of the ceremonial payment of a Red Rose to the heirs of Baron Henry William Steigel for the church and cemetery in the borough of Manheim, Pennsylvania, which the Baron gave to the congregation. Fearing that the property might at some time be claimed by his heirs, there was a proviso in the deed that an annual rental of one Red Rose should be paid for it. From an elaborate account of this ceremony in a recent issue of the *Manheim Sun*, this Rose festival has come to be one of the most interesting events in that part of Pennsylvania. The oldest descendant of Baron Steigel, Mrs. Rebecca Boyer, of Harrisburg, the great granddaughter of the Baron, who is now eighty-seven years old, received the tribute from the pastor of the church. There was much music and oratory and historical reminiscence with a display of old tapestry and floral decoration of the most lavish character.

The practice seems to be growing in England of providing gardens for instruction in connection with schools. Usually a rod of ground is set apart for each pupil, though sometimes a larger area is furnished, and it is prepared for them by deep digging or trenching and manuring. Sets of tools, with sheds

for them, are furnished, and when it is necessary the garden is fenced in, and seeds are usually furnished at the start. Very often the schoolmaster is a good amateur gardener, in which case the young gardeners are placed under his immediate control, otherwise they are in charge of good local gardeners, who act as teachers, and, although the instruction is usually confined to vegetable-culture, so much of the groundwork of general gardening is taught that it is hoped that boys so trained will be well grounded, at least, in the essentials of the cultivation of plants.

One of the most famous and most beautiful public promenades in the United States is the Lake Shore Drive in Chicago, beginning in Lincoln Park and prolonged for the most part in full sight of the lake, for a distance of twenty-five miles under the name of the Sheridan Road. It is now proposed to continue this drive, with its adjacent ornamental features, as far north as the suburb of Evanston, a further distance of fourteen miles, and eventually to the city of Milwaukee. If the project is carried out, park boards will be formed in the different counties through which the drive will pass, and the right will be conferred upon them to condemn any property they may require. In some places the shores of the lake here rise into bluffs from forty to eighty feet in height, diversified by steep ravines; and, of course, this means unusual pictur-esque ness for that part of our country.

The newly established American School of Architecture in Rome has removed from its temporary quarters to a permanent home in the building so well known to travelers as the Casino dell' Aurora, from the famous frescoes by Guercino which it contains. It stands on the Pincian Hill, not far from the Villa Medici (the home of the French students who win the Prix de Rome), on an isolated plot of ground which once formed part of the celebrated Ludovisi Gardens. Its grounds cover about 80,000 square feet, and were laid out in the seventeenth century by Lenôtre; they contain many magnificent old trees and command a fine view over the campagna beyond the city wall; and it may be expected that young American architects who study amid such surroundings will greatly help to spread in their own country a true sense of the importance of gardening art, not as a mere accessory to architecture, but as a sister art of equal rank and indispensable utility.

It is well known that seed-potatoes which are stored for late planting often become soft, while much of their nutritive matter is exhausted in developing sprouts which must be broken off in planting. The first sprout is always the strongest and thriest, but it often happens that these sprouts have to be removed several times before the potatoes are planted, and each time some of the vitality of the tubers is lost. A comparative test was made by Professor Tatt at the Michigan Experiment Station last year, when two equal lots of potatoes were taken, one being left in the cellar, the other spread in a dry, well-lighted, moderately warm room. On April 20th, both lots were planted side by side and the plants from the unsprouted seed came up first, looked the best throughout the season, and produced a greater amount of potatoes and a greater proportion of large ones with fewer ill-shaped tubers. Of course, it hardly needed an experiment to demonstrate the superiority of unsprouted seed, but since no one can afford to grow anything but the very best crops it would seem to be worth while to take every precaution to prevent sprouting, or to secure second-crop seed from the south, which is rarely affected in this way.

Alligator pears, from the United States of Colombia, are offered in some of the fancy fruit stores at thirty cents apiece. This fruit of *Persea gratissima*, a small tree common in the West Indies and the Mauritius, has the form and size of a large pear. In the countries where it is native it is valued as a dessert fruit. Here it is mainly bought by Cubans and Spaniards and is used as a salad. Peaches from Georgia now sell for twenty-five cents a quart. They are much smaller and lack the distinct aromatic fragrance of the larger California fruit, but they are really of excellent quality. The old Illinois variety, Alexander, is as yet the only sort coming from California, a greenish white fruit which so early in the season lacks its deep red flush. They sell for sixty cents a dozen. Besides the small red native plums, which are still coming from Georgia, the market is receiving several choice varieties from California. The first lot received were Clymans, a sort originated many years ago in Napa Valley. They are a mottled reddish purple, covered with a showy blue bloom, and sell now for thirty cents a dozen. A highly colored blue plum of good quality, Silva's Koning Claudio, or Miller's Early, and the large dark purple Tragedy Prune complete the list.

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TABLE OF CONTENTS.

EDITORIAL ARTICLES: —The Proposed Statue in Bowling Green.....	251
Rhododendrons in a Natural Wood. (With figure.)	252
Gnotheras on the Prairies.....	Professor F. J. Waugh.....
Gnotheras on the Prairies.....	W. Watson.....
FOREIGN CORRESPONDENCE: —London Letter.....	253
PLANT NOTES:	254
CULTURAL DEPARTMENT: —Notes about Annuals.....	Robert Cameron.....
The Rock-garden.....	T. D. Hatfield.....
Strawberry Culture.....	E. O. Orpet.....
The Vegetable Garden.....	W. N. Craig.....
CORRESPONDENCE: —New Fields in California Fruit-growing, <i>William M. Tisdale</i>	255
MEETINGS OF SOCIETIES: —Convention of Nurserymen at Indianapolis.....	256
RECENT PUBLICATIONS:	259
NOTES:	260
ILLUSTRATION: —Rhododendrons in a Natural Wood, at Westbrook, Long Island, <i>Fig. 37</i>	261

The Proposed Statue in Bowling Green.

THREE or four months ago a gentleman of this city wrote to the Park Commissioners that he had a bronze statue of one of his direct ancestors and of heroic size—it is really six feet two inches high—which he was ready to present to the city, with an appropriate pedestal, and for which he would prepare a proper foundation on the condition that it should be placed in Bowling Green. Very obviously the commissioners should have refused to accept the statue with this proviso. They have been placed in charge of the public grounds of this city and have assumed the responsibility, not only of protecting them from the intrusion of objects which may detract in any way from their value, but to guard them from any change which does not directly add to their value as parks. It is quite as much a question of art to decide upon a site for a statue as to pass upon its intrinsic merit. Any statue which has sufficient artistic value to justify its purchase by the city, or its acceptance by the city as a gift, deserves to be placed where it can be seen to the best advantage. On the other hand, it ought not to be admitted into any of the city's public grounds unless it can be placed so as to add in some way to their beauty or usefulness.

As we remember, the obelisk was accepted with a proviso as to its location by the commissioners, and it was placed where it now stands without any consultation with a paid and responsible landscape architect connected with the department. The President of the Park Board at that time stated that the public-spirited gentleman who brought the monument to this country desired that it should be placed on a knoll in the park, and this individual preference was offered as a sufficient reason for erecting it on its present site. Now, an obelisk is impressive because of its definite contrast between the vertical and the horizontal, and the Egyptians who invented this form of architectural ornament never thought of placing one on an eminence. Indeed, a memorial was signed by many of the leading artists of the city, when it was being moved from the vessel which brought it from Egypt, asking that it should be placed in the plaza at the Fifth Avenue entrance to the park, where it would stand on absolutely level ground,

from which it could be viewed at different distances, and where it could be approached from every side, and where its full meaning could be brought out. As it now stands there is nothing to emphasize its rigid uprightness. It loses its austere expression from its connection with the flowing lines of the ground on which it stands. Of course, it is no addition to the beauty of the park. Besides this, many beautiful trees were cut away to make room for it, a stretch of green turf was interrupted, and the top of a beautiful hillock which made in itself a delightful picture was shaved off to make room for a work that was altogether alien to its surroundings. In short, the park itself suffered serious damage, and the obelisk has lost its dignity and impressiveness because it was improperly set.

For many years there has been a committee to pass upon the merits of statues which it was proposed to erect in our public grounds, and we believe that the present commission has transferred this authority of selection to the National Sculpture Society. In this way the parks are now reasonably fortified against a promiscuous invasion of bad statues. But, very plainly, the decision of the question where any statues are to stand must finally rest with the Park Commissioners. One of the reasons for their official existence is the protection of the parks from being desolated by the partisans of special ideas on special occasions. A park board has no right to consider the preference of individuals as against the rights of all the people. Whenever the park board is importuned to admit any alleged work of art, or any building for a special purpose, or to devote a part of its grounds to a specific use, their attitude at such a crisis should invariably be one of conservatism and respectful criticism. There always will be found persons who are willing to celebrate themselves or their ancestors by giving the city a statue, provided they can have it set up in some prominent place. There always will be public-spirited citizens who are carried away by some novelty which they wish to introduce in the parks. But the park board stands against the preferences and demands of individuals and of special classes and for the greatest usefulness to all the people. And when it is considered that the beauty of the parks is their highest use, it is plain that such a point as the location of a statue should be decided by some final court, in whose taste and training and experience and artistic sympathy the people can repose confidence. Commissioners are rarely chosen for their ability to decide questions of art, but, as the settlement of such questions must finally rest with them, their plain duty is to have a permanent and paid officer in such matters to whom they can refer these questions with confidence.

As for the statue of Colonel Abraham De Peyster, which it is proposed to set up in Bowling Green, it may be said that the former advisory committee of the park has pronounced it "a fairly successful work." Colonel De Peyster was Mayor of this city two hundred years ago, but it may be doubted whether he is a figure of sufficient historical importance to justify the devotion of a part of such valuable ground as Bowling Green to his memory, even if the statue in itself were of the highest artistic excellence. Probably not one out of a thousand persons who pass the site of the statue every day has ever heard of his name. Again, this is one of the oldest open spaces in the city, and it stands at the beginning of the city's great thoroughfare. If any consistent scheme for beautifying the city with works of historical or artistic significance is ever adopted it will be a point of singular value. It is even now one of the most interesting spots in the city for its traditions, and its grass and water and trees make an attractive picture even if it had no such associations. The President of the National Sculpture Society has put on record his opinion that no portrait statue should be placed there, but that the ground should be reserved for some more impressive work if it is to serve any other purpose than the one it now so satisfactorily fills. However that may be, it was the plain duty of the Park Board, when the Bowling Green site for the statue was suggested, to refer the matter to their

landscape architect. Mr. Vaux, as one of the designers of Central Park and of other parks of the city, and by his long service in the department, thoroughly understands what a park is and what it is for. He stands primarily for the artistic treatment of the parks. He has made a study of just such questions as these, and he is employed to give advice whenever a problem of this sort is presented to the Board for solution. Nevertheless, the question was not referred to him, but to one of the commissioners, who does not pretend that he has ever had any training or experience that would give value to his opinion on such a point.

When the Park Board which was superseded by the present one attempted to lay out the Harlem speedway without consulting its official adviser the people protested against the act as a violation of the obligations they had assumed. The same considerations which condemned that Board for their action in relation to the speedway apply in the present case. If the commissioners should adopt a design for a new park prepared by one of their number, it would be considered an intolerable assumption of authority, but the placing of an alleged work of art on the city's public ground is quite as much outside of his proper function. There is only one way to defend the parks against vulgar intrusion, and to hold them steadily to their original purpose without any impairment of their value, and that is to defer matters of this sort to some paid and permanent official whose capability is unquestioned, and who is held to the careful performance of his duties by a sense of his professional responsibility.

Rhododendrons in a Natural Wood.

THE illustration on page 255 represents a driveway through a natural wood in Westbrook, the estate of W. Bayard Cutting, Esq., on the shores of Great South Bay, Long Island. Unfortunately, the original photograph lacked sharpness of detail, and, therefore, much of the beauty of the view is lost in the reproduction. It suffices, however, to show how Rhododendrons can be successfully used in connection with the natural undergrowth of woodlands without being so obtrusive, even when in full flower, as to give an effect of artificiality where it is the leading intention to preserve the spirit of native wildness and seclusion. Even when at their height of bloom the deep shadows and abundant foliage above and about them soften the glow of color, so that they seem but little more conspicuous than the Kalmias, Clethras, Viburnums, Thorns, Elders and Wild Roses which flourish and flower abundantly in that region. And it must be remembered that these plants are in flower but a comparatively short time during the year, and as Mr. Cutting remains late in the country, the evergreen foliage of the Rhododendrons is of great value all the year round, and especially in winter.

The successful use of Rhododendrons in the woods is also interesting as a horticultural experiment on the south side of Long Island, where the light, dry soil contains apparently very little plant-food. It was rightly judged that even near the shore these plants would flourish under the shelter of the woods, which would at once defend them from driving winds and from the snow-reflected sunlight in winter, if they could only be supplied with proper soil conditions. In order to secure moisture, advantage was taken of a natural depression in the woods along the bottom and sides of which one of the principal plantations was made. Beds were here excavated to the depth of some two feet, and since peaty soil was not available, loam from the woods was mixed with good barnyard manure and leaf-mold from the surface of the Pine woods. Under this treatment the plants have grown well, and although they have suffered as Rhododendrons did elsewhere during the trying weather of last winter, a fortnight ago they were all showing admirable flowers in fair-sized trusses. Perhaps the plants in the lowest part of the hollow are the largest, but they do

not seem more thrifty than those on higher soil, or than the isolated plants which are scattered through the woods to connect the different groups with each other and with the natural underwood. No Kalmias originally grew in this particular woodland, but they abound near by, and Mr. Cutting has successfully transplanted these also from their native woods, and their flowers and evergreen foliage make a harmonious addition to the natural scenery of the place.

At this season the Rhododendrons are probably the most striking feature of the estate, although they are mostly confined to the borders of the drives through the woods. But in its general treatment Westbrook furnishes an interesting illustration of a successful effort to emphasize and develop the natural features of these wooded shorelands. On one side of the house the woods have been thinned out, leaving vigorous young Oaks and other native trees, which are allowed to remain until they interfere with each other, and already what was once a forest is now an expanse of park-like land, which will continue to improve as the trees increase in age and dignity of expression. Some of the Oaks now are fine broad-spreading specimens, and one rarely sees more luxuriant and glossy foliage than they carry. On another side of the house a broad lawn stretches toward the shore, giving a glimpse of sea in the offing. This lawn is set in a natural and irregular wood border, and on one side of it an open group of Pines, with their dusky shadows, gives the final finish to an exquisite picture.

Apart from these large features of the design there are drives through Pine woods and along the water and between masses of foliage almost as dense as a close-set hedge, and secluded paths which lead through the wild-wood it may be to a bridge across some inlet of the bay or it may be to shores which are brightened with the flowers of Irises and many other water-loving plants. The shores and thickets and wood borders are rich in the variety of their native vegetation, and Clethras, Ilexes, Myricas, Viburnums, Dwarf Willows, Cornels, Sassafras, Beach Plum and many other shrubs and low trees give a diversity of form and color and character to the masses of foliage which are a continual delight. Along with these, the Sweetbrier and Rosa rugosa are quite as much in keeping with the scene as the native Roses among which they grew. Clematis paniculata clammers over the shrubbery as contentedly as if it had always been at home there, and the golden flowers of Iris Pseudacorus are quite as much in accord with the natural wildness of the scene as those of our own Blue Flag. In thus adding to the natural richness of the woods, good judgment has been exercised in selecting such plants as are suited to the spirit of the place. It is especially gratifying to observe with what apparent abandon Rosa rugosa gives itself up to this untamed life, and how perfectly its glossy leaves and the careless, unconventional way in which its flowers open adapt it to half-wild situations. Of course, in a large estate like this there are greenhouses and flower gardens to interest any one with horticultural tastes, but its leading attraction, after all, is the appreciative and respectful way in which the native and distinctive features of the place have been treated. These wooded shorelands have a quiet charm of their own which is well worth preserving, and one who apprehends and cherishes the true spirit of the place, and submits himself to its guidance, is in little danger of going wrong in his planning or planting. An intelligent and affectionate regard for what Nature has done for this part of Long Island will save any one who attempts to develop its landscape resources from the mistake of decorating it with elaborate floral embroidery or from importing many strange and incongruous exotics to mingle with the varied, but ever graceful and harmonious, native vegetation.

Many large trees about a house—especially Elms—are an indication of old family distinction and worth. . . . Any evidence of care bestowed on these trees compels the traveler's respect as for a nobler husbandry than the raising of corn and potatoes.—*Thoreau*.

Œnotheras on the Prairies.

THIS genus of beautiful wild flowers is one of the richest and best in its attractive species. During May the blossoms are most numerous, though one species or another can be found in flower at almost any season of the year. *Œnothera sinuata* and *Œ. serrulata* especially have a long season of flowering.

Probably the most attractive prairie species is *Œnothera speciosa*, whose magnificent large white flowers light up the gathering shadows in the ravines as the spring sun goes down. The blossoms are delicate in texture and color, and have a dignified grace of outline, which, expressed in the pure white material of the freshly opened petals, has an effect akin to what we feel in the presence of beautiful and simple statuary. It has the same expression of purity so characteristic of Calla Lilies and *Lilium longiflorum*, but without the waxy appearance which makes such flowers look so artificial. It is not surprising that this species is a general favorite, in spite of its perishability. The bright sun and a light wind in the morning soon change the petals first to a beautiful rose, then to deeper pink, and soon they wither entirely.

Larger and longer in calyx tube and of more brilliant features is *Œnothera Missouriensis*. This species has immense yellow flowers, often measuring two and three inches in diameter, with a calyx tube three or four inches long. The petals are a clear, brilliant yellow, and resist the hot sun with some success. The plants are low-growing and coarse, but they take to the most barren and exposed hillsides where their rather gaudy displays are the more welcome.

Œnothera sinuata is quite a weed in some places. Mr. T. O. Munson has recently related* that this species "makes splendid greens, equal in my estimation to Spinach." The blossoms, though individually pretty, are small and sessile on the coarse stem among rough leaves, so that they rank very low in ornamental value. *Œ. serrulata* is one of the most characteristic of prairie flowers, having a wide range and a long season. It seems to have no preference for hillsides or hollows, but grows at large also on the level areas of grass land, which in many places stretch out for miles unbroken. The different botanical varieties of this species are very interesting.

Œnothera biennis is more of a coarse-looking weed, and is hardly a creditable member of this genus, viewed from a purely artistic point. But other species, less common than those already mentioned, usually agree in enhancing the attractiveness of the prairie flora. Among those more or less frequently collected in this country should be mentioned *Œ. Hartwegi*, *Œ. pinnatifida*, *Œ. rhombipetala* and *Œ. linifolia*. Others are found in different localities, but do not seem to be so generally distributed.

Oklahoma Agricultural College.

F. A. Waugh.

Foreign Correspondence.

London Letter.

CRINUM SCHIMPERI.—This is a good plant for the cold greenhouse or frame, or, indeed, any position where severe frost is excluded. It thrives at Kew under treatment which suits the Stenomessons, Ismenes and Belladonna Lily, flowering freely in midsummer. The flowers are tubular, rather narrow, and not unlike those of *Crinum Capense* or *longifolium*, but white and fragrant. When grown in a warm greenhouse it flowers in May, but the leaves are somewhat drawn. We are indebted to Herr Max Leichtlin for the possession of this plant. It was first distributed under the name of *C. Abyssinicum*, and is still known by some cultivators under this name. It is a native of Abyssinia, from whence it was sent by Herr Schimper about twenty years ago. It is one of the few *Crinums* from Africa which are easily managed under cultivation here. A good figure of

this species is published in the last number of the *Botanical Magazine* (t. 7417), where Mr. Baker describes it as a half-hardy species with globose bulbs the size of a man's fist, with an elongated neck; leaves linear, recurving, glabrous glaucous, three feet long, two inches wide at the base, gradually tapering to the point; peduncle stout, terete, two feet long, brownish; perianth tube four inches long, tinged with red, limb funnel-shaped, four inches long, with recurved segments, pure white; stamens white declinate, shorter than the perianth-limb. It belongs to the same group as *C. latifolium*, *C. Zeylanicum* and *C. longifolium*, and closely resembles *C. Abyssinicum*, which Schimper discovered in the mountains of Abyssinia in 1838, but which has not yet been introduced into cultivation.

STENOMESSON INCARNATUM.—If this plant were only freer in the production of flowers it would become a popular garden bulb. Unfortunately, however, neither it nor any one of the dozen species known can be depended upon to bloom, although they are easily grown in pots in a cold greenhouse or planted out in a sunny frame. Some of them are known in gardens under the generic title of Coburgia, the best form of *Stenomesson incarnatum* being called Coburgia trichroma. This is now in flower in the Cape-house at Kew, and its umbels of tubular pendent flowers, each three inches long and colored carmine-red and yellow and tipped with grass-green, are very attractive. We flower these plants by preventing them from becoming overcrowded with offsets, which they produce in abundance, but which should be removed when the bulbs are started in February.

HÆMANTHUS KALBREVERI.—Large numbers of the bulbs of this handsome species from tropical Africa have been distributed in England recently, and consequently its brilliant blossoms are not now uncommon in collections of stove-plants. At the Temple Show there were some magnificent heads of flowers shown by Messrs. J. Veitch & Sons, and in the St. Albans nursery they were very numerous about a month ago. At Kew they have been in flower since April, and are not all over yet. When this species was first introduced, now about fifteen years ago, it obtained a bad name with cultivators because it generally failed to bloom a second time. Now, however, that its requirements are understood, it is a favorite with growers of bulbous plants. The treatment essential to its success in the garden is a tropical, moist, sunny house while it is growing, and a dry position on a shelf in an intermediate temperature while it is at rest. I suppose we ought to follow Mr. Baker and call it *Hæmanthus multiflora*, variety.

CYRTANTHUS HUTTONI.—This is one of three larger-flowered species of *Cyrtanthus*, the other two being *C. obliquus* and *C. carneus*. It is as easily grown as *C. Mackenii*, which is a weed at Kew, but as yet *C. Huttoni* is rare, although first flowered here thirty years ago. It has lorate leaves, contemporary with the flowers, a foot long, nearly an inch wide, and in habit suggestive of *Agapanthus*. The scape is stout, fifteen inches long, bearing an umbel of six flowers which are sub-pendent, nearly two inches long, tubular, with short reflexed segments, and the color pale orange-scarlet. Plants of it have been raised from seeds at Kew, and several of them are now in flower. A figure of it will shortly be published in the *Botanical Magazine*. It is a native of South Africa, in the neighborhood of Grahamstown, where I saw it in flower eight years ago.

EUCHARIS LOWII.—This is nothing more than an erratic form of *Eucharis grandiflora* (*Amazonica*), with the three inner segments of the corolla incurved and twisted toward the centre, and, therefore, not quite so satisfactory as a flower as *E. grandiflora* itself. It is, however, worthy of note that this character is constant in all the many plants that I have seen of *E. Lowii*.

EURYCLES SYLVESTRIS is a good stove bulbous plant, as it is easily managed, and when bearing its large umbels of white *Eucharis* like flowers it is decidedly attractive. Treated exactly as we treat *Hippeastrums* it is perfectly

* *American Horticulturist*, vol. v., p. 44.

happy, flowering in September. This year, however, some of the bulbs have come into flower in June, possibly because they went to rest earlier than usual last autumn. There can be no doubt of the necessity of a decided period of rest for many tropical bulbs to induce them to flower.

LILUM HENRYI.—This fine Lily has not suffered in the slightest from the excessive cold experienced here in February last; on the contrary, it has proved itself to be one of the hardiest of all, neither small bulbs nor large having been injured; whereas the Burmese species, that is, *Lilium sulphureum*, *L. Wallichianum* and *L. Nepalense*, were killed outright by the frost. Any plant which stood the cold of last winter here may be accepted as perfectly hardy, the cold having been so intense that our native Ling and Gorse were in many places killed to the ground. *Lilium Henryi* is now in splendid health, the stems being a yard high and nearly an inch in diameter. Seedlings raised from seeds ripened in the garden here are now sturdy plants and promise to flower this year. Too much cannot be said in favor of this plant as a distinct, hardy, handsome, easily grown Lily.

London.

W. Watson.

Plant Notes.

PHILADELPHUS ZEYHERI.—Under this name a shrub was sent out several years ago by the Messrs. Parsons, of Flushing, Long Island, which is quite different in appearance from the numerous Mock Oranges in ordinary cultivation. It is just passing out of bloom, being considerably later in flower than the well-known *Philadelphus coronarius*. *P. Zeyheri*, or, as it is sometimes called, *P. Falconeri*, is a vigorous, rather upright, shrub with arching branches, and grows to a height of six or eight feet. The leaves are narrower, rather smaller, and usually more sparse than those of *P. coronarius* or *P. grandiflora*. The narrow petals do not open horizontally, so as to make a flat flower, but one rather bell-shaped in general contour, although when looked at directly in front the separate, boat-shaped and pointed petals give it the appearance of a star. The flowers are but slightly fragrant. The branchlets, each of which bears four or five flowers, are arranged closely on the main stem, and when in flower the shrub has a distinct and pleasing appearance. Most of the Mock Oranges are desirable free-flowering shrubs, and as they hybridize easily they assume a variety of forms, which makes a satisfactory classification of them extremely difficult, if not impossible.

BESCHORNERIA YUCCOIDES.—This is a member of a genus of the Amaryllis family, natives of Mexico. Mr. Baker gives five species as well known, and five others as imperfectly known. In his arrangement of the family Beschorneria follows Bravaea, and is followed by Doryanthes, but, horticulturally considered, it is very unlike either. *B. yuccoides* forms a cluster of blue-green, sharp-pointed leaves about two feet long and an inch and a half wide. The plant has a very Yucca-like appearance, except in color, and is exceedingly ornamental. It will stand a temperature of fifteen or twenty degrees, Fahrenheit, for a time without injury, or, perhaps, even less; but that is as low as it has been tested here. Mr. Baker, in his *Amaryllideæ*, gives two instances of its flowering in cultivation—once with Mr. Wilson Saunders, at Reigate, in 1860, and once at Kew in 1875. We can assume, therefore, that its flowering is a rare occurrence, and it is gratifying to learn that this spring one of two plants, raised from seed planted about ten years ago, has been flowered by Mr. W. E. Endicott, of Canton, Massachusetts. Mr. Endicott writes that its inflorescence is not of a showy character, but, like that of the nearly allied Agaves, is very interesting. The flower-stalk was of a beautiful bright pink from base to summit, and it attained a height of four feet. It came from the centre of the plant, and was set with bright pink bracts three inches long, placed about four inches apart; it made an abrupt, though not very divergent, angle at each bract.

The buds appeared from all but the four lower bracts, emerging in pairs, and were bright yellow at first. They rapidly assumed a paler tint, and when open were of a faint greenish white. The entire length of each flower was two and a half inches. Mr. Endicott considers the plant valuable for its foliage rather than for its flowers. This species has been figured in the *Botanical Magazine*, t. 5203.

IRIS NEPALENSIS, var. LETHA.—The Nepaul Iris is an interesting one, being distinct in that at the resting period the plant is reduced to a mere bud, protected by the fibrous remains of the sheath, and furnished with thin, fleshy, persistent roots. Professor Forster, in *Bulbous Irises*, thinks it nearly related to the Juno Irises, though it is classed by Baker in the subgenus Evansea. *I. Nepalensis* is supposed to be not hardy, and Mr. Gerard, after cultivating it several years in rich moist soil and drying off the bulbs in winter, has failed to flower it, so that it justifies its reputation as a shy bloomer. While enthusiastic gardeners usually have the patience to work at plants which offer difficult problems, it is fortunate that in the variety *Letha*, which comes from Upper Burma, we have a plant harder and more apt to flower than the type. The plants have not been tested here for hardiness, but it flowered with Mr. Gerard last week before the narrow leaves have made more than a few inches of growth. The flowers are very beautiful, of a light lavender shade, with the faintest reddish flush and a yellowish ridge. More exactly, the color is a dense lining on a white ground. The flower, delicately perfumed, is of fine form, the standards spreading, and the crests rather abnormally developed. The flowers are very fugacious, opening late in the morning and lasting scarcely six hours. The plants flower at a height of about six inches. The habit is different from that of the typical species, which has longer leaves.

DICTAMNUS ALBUS (FRAXINELLA).—This plant, the common name of which is Dittany or Fraxinella, has been in cultivation since 1596. It is a native of eastern Europe and Asia and belongs to the Rue family, Rutaceæ. It is a hardy herbaceous plant, some eighteen inches or more in height, with dark green pinnate foliage and strongly aromatic. The flowers appear in large terminal spikes in early June; in the type they are white, but a variety with pale purple flowers is more common. The plant is vigorous and easily grown; it succeeds in almost any good soil, preferring a well-drained and sunny situation. The propagation is by division or by seeds; the latter should be sowed as soon as gathered. This plant is not only desirable for the beauty of its flowers and foliage, but the peculiarity which gives it the common name of Gas Plant adds much interest to its cultivation. If a lighted match is applied to the flower-spike when the plant is in full bloom a flame will be produced sometimes eight or ten inches in length; this experiment succeeds best at the close of the day and in calm weather. This phenomenon is due to the inflammability of a very volatile oil secreted by numerous glands on the flowers and flower-stalks. Although much more marked at the culmination of the inflorescence, it is quite possible to obtain the flame at any time after the flower-buds are well developed until the fruit begins to ripen.

PAPAVER INVOLUCRATUM MAXIMUM.—This is one of the best of the perennial Poppies, and superior in many respects to the well-known *Papaver orientale* and *P. bracteatum*. Although it evidently belongs to this section of the genus, it does not appear to be described by the common authorities on garden plants. It is probably a true species, as there is no difficulty in obtaining the plants from seeds, which are easily procured and are offered by many of the German dealers. This plant is remarkable, not only for its large flower, but also for its deep color, which is rather a crimson than a scarlet. It has the big black blotch at the base of the petals, and, in general, its foliage, habits of growth, etc., resemble the Oriental Poppies, but the leaves are, perhaps, a trifle darker and less hairy; the flower-stalks are less numerous, much taller and stiffer. It is very difficult

to distinguish them from the better-known species when out of bloom. It is highly probable that this is the plant known as Parkman's Poppy, but there is much confusion now as to the identity of this last-named plant, since some dealers send any good form of *P. orientale* or *P. bracteatum*, and others the plant which is now described. Any good soil and sunny position suits it; it should be grown with sufficient room to permit the introduction of other plants; otherwise, after the tops die down, an unsightly bare spot will be left in the border; *Kniphofias*, or Japanese Anemones make an admirable succession. This and all other Oriental Poppies are easily propagated by root-cuttings, which may be made at any time during the autumn and kept in a cool greenhouse during the winter; by May they should

Cultural Department.

Notes about Annuals.

WE raise most of our annuals in frames and begin to transplant them into their permanent places in the beds and borders about the 20th of May, when danger of frost is past. When thus treated they bloom earlier and their flowers continue for a longer time. Nearly all the annuals raised for garden decorations can, however, be grown from seeds sown in the beds and borders in early summer. After the seeds have germinated and the small, tender seedlings are large enough to handle they should be well thinned out, giving enough room to each plant to make a well-developed specimen. Another important point to be attended to in the cultivation of annuals is the staking of the larger growing ones.



Fig. 37.—Rhododendrons in a Natural Wood, at Westbrook, Long Island.—See page 252.

be established in three-inch pots, and if planted out then will make blooming specimens the following year. Any varieties differing from the type can thus be propagated with certainty.

PAPAVER FUGAX.—This is another good Poppy which is not often grown in gardens. This plant is distinguished by soft glaucous green foliage, a tuft of radical leaves, spreading a foot in diameter, from which springs the flower-stalk two feet or more high. The flowers are a pale orange-red, very numerous, but lasting only a day, whence the name *Fugax*; they are of no use for cutting, but the combination of flower and foliage in the herbaceous border is most effective. The plant is perfectly hardy and is a biennial; when once introduced into a garden it is likely to persist from self-sown seeds.

Many annuals have not large strong roots and are unable to stand a storm of wind and rain, and if once blown down they are never so satisfactory afterward. If a little care and attention are given to this class of plants they are as useful and give as much pleasure as any plants. Many of the annuals in our garden are grown for scientific purposes, and are not showy and attractive. Nevertheless, we have a large number of showy ones, and those mentioned in these notes are worthy of a place in any garden.

Omphalodes linifolia is an annual plant that has been grown in European gardens for nearly a century and a half, but is seldom seen in this country. A few plants massed together are very effective with their light airy flower-stems and white flowers resembling forget-me-nots. The plants are about one foot high, and the whitish flowers are in loose racemes which last a long time.

Another useful annual is *Acroclinium roseum*, a south-west

Australian plant, introduced into England in 1854. It is a slender, gracefully branched plant, and its rose-colored flowers are borne singly on the ends of the slender branches. The flowers are "everlasting." There is also a white-flowered variety in bloom now. It is like the type in habit and size, but its flowers are white. *Acrocliniums* grow well in a rich loamy soil, with plenty of sunlight.

Downingia pulchella is a pretty dwarf native plant. It is about six inches high and has showy rich blue Lobelia-like flowers. Its dwarf compact habit, with its freedom in flowering, makes it a useful plant, and it is used for edging beds where larger plants are grown. We are told that it grows on wet banks in California, and is also found in the borders of north Nevada and Oregon. We grow it here in an open position and in a light rich soil, and it gives good satisfaction. This plant is also known in gardens under the generic name *Centonia*. There are several varieties of this *Downingia* in cultivation, the only difference being in the color of the flowers. The two best sorts are *Atropurpurea*, which has slightly larger flowers than the type and of a dark purple color, and *Alba*, a form with white flowers.

Asperula orientalis is a showy annual, well worth growing. It is a foot high and has beautiful sky-blue flowers, produced plentifully in terminal heads, and they are useful for cutting. Its leaves are lanceolate and in whorls on the stems. In a slightly shaded position and a light open soil it produces its flowers for several weeks. This plant is found in gardens sometimes under the name *Asperula azurea setosa*.

Pentachaeta aurea is a charming dwarf Californian annual about six inches high. Its stems are well clothed with filiform, linear, alternate leaves, and they are diffusely branched. Its flower-heads are very showy, of a bright golden color, and abundant. The flowers are about one inch in diameter and of an exceptionally bright yellow color, which makes them attractive at this time. *P. aurea* thrives in a light soil, and the flowers have a brighter color when the plants have sunshine all day.

Another pleasing Californian plant in bloom now is *Lasthenia glabrata*. It has slightly pubescent branched stems with linear leaves. The yellow flower-heads, which terminate the stems, are an inch in diameter, and are produced in large numbers, so that the plant is showy and attractive. It is found in a wild state in moist grounds in west California.

Perhaps no annual in the garden is so much admired at this time as *Mesembryanthemum pomeridianum*. The plants are about eight inches high, and they have stout hairy branched stems with broad, lanceolate, flat, smooth leaves. The flowers are about two inches across and of a light yellow color; they are showy, and are produced singly on long hairy peduncles. If seeds are sown in March in the greenhouse and the plants grown along they will flower almost as soon as they are planted out in the garden in May. A sunny position and light soil are necessary.

A bed of the native *Collinsia verna*, two feet wide by four feet long, is now making a beautiful display. This is an erect slightly branched plant with lanceolate leaves, and grows about eight inches high. The flowers are in whorls and are on long pedicels. The lower lip of the flower is of a bright blue, and the upper petal is white. This pretty annual requires a cool shady position and a rather moist soil.

Robert Cameron.

The Rock-garden.

THE feature of the rock-garden in May is its masses of bright color, supplied by pink and white Moss Pinks, ultramarine blue *Mertensias*, the clear white of *Arabis albida*, and the golden *Alyssum saxatile* in variety. In June the garden undergoes an entire transformation, and we have a miscellaneous variety of plants. In fact, the whole charm of the rock-garden lies not so much in its masses of color, arranged for effect, as in an interesting variety of plants, many of which have some charm or association which we cherish. How important it is that the care of these plants should be in the hands of some one specially interested in them was impressed upon me recently when a mass of seedlings of *Aster Taraxicus* came near being weeded out. This beautiful species, with large lavender-blue flowers, blooms in late summer. It is one of the plants of moderate growth, not exceeding two feet high, which we need to break the monotonous effect where the collection is made up almost wholly of low-growing plants. Its color, too, contrasts charmingly with the later-flowering Iceland Poppies, which are mostly of yellow and orange shades. Again, it is important to weed out many plants which, by their abundant reproductive power,

soon overrun many of the lesser, and often choicer, kinds. *Oenothera riparia* will grow almost anywhere. While not especially showy, it is yet a neat little species, and useful to leave where others grow less freely, but it sows itself so easily that it is sometimes a temptation to do away with it altogether. *Campanula Carpatica*, one of our best dwarf Bellflowers, is abundant all over the garden in many forms, including the distinctly beautiful *C. turbinata*. These dwarf Bellflowers are so charming as seen among the notches and crevices of the rocks that it is not easy to have too many of them. But they persistently and insidiously grow up from the seedling stage, encroaching upon the territory belonging to other plants, and even threaten our paths. They are not alone in this respect. Many of our choicer plants, seeding themselves, have found a safe retreat during winter among the mossy undergrowths in the gravel paths. Here, while all our old plants of the beautiful *Primula rosea*, from the Himalayas, the most delightful of our early Primroses, were killed outright, self-sown seedlings from last year, which scarcely made growth enough to be visible, broke away with a fine growth this spring; otherwise we should have lost them entirely.

That the large Oriental Poppies are fit subjects for the rock-garden some will not be willing to admit. Perhaps in a small garden in limited grounds they might appear glaring and somewhat coarse in growth, but in a large garden, where trees, shrubs, grassy slopes and water all enter into the landscape, they are quite appropriate. Of these we have several fine varieties, varying from the deepest crimson through orange shades to almost pink. So, too, in a large garden such shrubs as the Japanese *Photinia villosa*, a near ally of the American Shad-bush, the low-growing *Hypericum Buckleyi*, the dwarf *Evonymus Americanus*, *Spiraea bullata*, *Fothergilla Gardenii* (a handsome little bush with heads of white flowers in early spring), *Leucothoe Catesbeiana*, *Anemone Japonica* and *A. floribunda*, the dwarf Rhododendrons, *R. Wilsoni* and *R. ferruginea*, now in bloom, are all effective, not to mention *Kalmias* and a host of other flowering shrubs and evergreens which could be used in an extensive arrangement of this kind. Some of our handsomest native and also foreign single Roses are most appropriate here. *Rosa rugosa* has been in bloom for a month past, and apart from the effectiveness of its abundant large violet and white flowers in summer, and its large orange-red hips in autumn and winter, it always exhales a pleasant odor. Then we have the Dawson Rose, a hybrid of the Multiflora and Jacqueminot types; the Persian Yellow, the Burnet, the Sweetbrier, and still several others of shrubby character, as well as the trailing *Rosa Wichuraiana*, of more recent introduction from Japan. *Clematis tubulosa*, deep blue, and *C. Davidiana*, lighter blue and fragrant, are rambling shrubs which are useful in giving character.

Phlox stellaris, light blue, a chance seedling of deeper-blue, and a few scattered flowers of the rose-colored *P. amœna* are all that remain in bloom of the low-growing Moss Pinks allied to *P. subulata*. *P. Carolina* is just opening. It came to us a few years ago among a lot of *Silene Virginica*, collected in its native habitat. This latter is a most attractive little gem; the color of its flowers being the most brilliant crimson. It sows itself freely, but mostly in shaded spots. This really is the only way we can keep it, as transplanted plants soon die out. The typical *Aquilegia Canadensis* is out of bloom. We weed out those which have been encroaching on other plants, being sure of enough seedlings to keep up a good display. This beautiful Columbine deserves more extended cultivation. It is one of our earliest plants to bloom, coming into flower with the Wood Lilies, Hepaticas and Dog's-tooth Violets, and before the Moss Pinks, Rock Cress and the mass of other spring flowers. Some hybrids with *Aquilegia cærulea* are nearly as bright in orange and red shades, and these with *A. glandulosa*, *A. Skinneri*, *A. Olympica* and *A. chrysanthia*, scattered through the whole garden, serve to make a most attractive picture. *Ajuga alpina*, *A. reptans* and a white-flowered form of the latter are all neat-growing kinds, with verticillate spikes of blue and white flowers. *Oenothera Missouriensis* just now shows a few of its magnificent sulphur-yellow fragrant blooms. This is the best of all the evening Primroses, and is a day bloomer as well. The Cranesbills are among our best rock-garden plants. *Geranium pratense*, in blue and white varieties, is pleasing in foliage as well as in flowers. *G. phænum*, of deep purple color, is also good. *G. sanguineum* is the dwarfest and most continuous bloomer, lasting from now until frost. *Potentilla tridentata* makes an excellent plant for crevices. Its white star-shaped flowers are pretty and continue for a long time. *Erodium Manescavi*, the Giant Heron, usually considered tender, has stood the severe test of last winter, and is again in bloom,

also *E. macradenum*, an elegant little species with finely divided foliage and small striped flowers, resembling in form and markings a miniature Fancy Pelargonium. *Raymonya Pyrenaica*, with curious flat leaves hugging the rocks closely on the shady sides, is now well established. The small rotate flowers of soft velvety blue are borne on pendent scapes, scarcely three inches high. *Saponaria ocymoides* is getting quite weedy, but is still so charming that we shall have a few patches of it. *Phyteuma Charmellii* is a showy and interesting member of the Bellwort family, with heads of bright blue flowers. It has proved thoroughly hardy, and, like the Scotch Bluebells, *Campanula rotundifolia*, is sowing itself in various parts of the garden. *Heuchera sanguinea* is not so fine this year, and examination shows it to be attacked with a root-gall. The lesson we learn from this is to get some seed and establish it in new soil. *Dianthus arenarius*, the Sand Pink, is now plentiful, and evidently has been hybridized to some extent with the Cyclops, as various shades of pink appear. *D. cuneatus*, the Maiden's Pink, is abundant, too, so much so that we have to weed it out in places. *Campanula fragilis*, with little upright bells of light blue, holds its own well. Various interesting annuals help to fill up a few unavoidable gaps. Among these, *Calceolaria scabiosifolia* has proved thoroughly hardy, coming up every season. *Layia elegans* is pretty, having straw-yellow Aster-like flowers. *Clintonia borealis* is a pretty little plant resembling a Lobelia very much.

T. D. Hatfield.

Wellesley, Mass.

Strawberry Culture.

WE are now in the midst of the Strawberry season, and as our preparation for next year's supply begins as soon as we have gathered the last berries, a few notes on the method adopted are in season. Some five years ago we made an experimental plantation to ascertain which were the most suitable kinds for our soil and climate. About twenty-five sorts were planted for this purpose, only two of which are now grown here, one being Michel's Early and the other the Gandy. Of the remainder there were doubtless many that would be satisfactory in some sections, but they were a failure here; some were winter-killed, some failed to go through the summer, while others were of poor quality for home use, where quality is the first consideration.

In garden-culture, where the space is often limited, it is essential to get the most out of the ground, and have none idle if possible. As Strawberries take up a good deal of space, we prepare a plot of ground well in spring. On this we plant early Peas, Spinach, Lettuce and the first sowing of Dwarf Beans, and any other crops that may be taken off before the beginning of August, and this tract is then used for the new Strawberry plantation. We find that it is useless to attempt to take more than two crops off the same bed; by the third year few of the original plants would be left, as many die each year from the grubs at the roots. After the second crop is gathered the plants are hoed off, and when dry enough are burned with the mulching under them right on the ground, and this is then prepared for the fall planting of Cabbage and Cauliflowers. Under this system we have no idle ground to keep clean, and the most is made out of the limited space at disposal. The runners for this year's planting will be taken from the bed planted last year, as there is more space between the rows wherein to plunge the pots. A trowelful of soil is dug up and placed in a three-inch pot, the pot being plunged in the hole made. The runner is then pressed into the pot, and in about two weeks will be fit to take off and plant in the new bed. We have to water a few times during this period if the weather is dry, but as the pots are sunk their depth in the ground the roots are kept cool and moist with little watering.

We adopt what is known as the hill system in planting, making the rows three feet apart and the plants two feet from each other in the rows, and the quantity produced in this way is surprising. The year-old bed produces fully two-thirds of a crop while the older one is at its maximum capacity. We have never kept a record of the quantity gathered, but hope to do so this season.

The soil we have to deal with is very shallow, with a gravel subsoil, making it difficult to keep the plants moist in summer, but we have never had them heave from frost in winter. A good soaking is given just as the first fruits begin to color, and this will carry them through even if we have no rain until all is gathered, when the beds are cleaned and watered well. Plenty of manure is used when preparing the soil for a crop that has to stand two years on the ground. In addition we apply a sprinkling of some good commercial fertilizer near the plants in the early summer before the lawn clippings are placed about them as a mulch.

From experience it seems best to cultivate only a few varieties. There is less liability to get the sorts mixed, and only a good early, a second early and late variety are needed to cover the season. Michel's Early is the best we have found for first berries, although it rarely escapes the late frosts that were so destructive this year. We have the Leader on trial as a possible substitute for it, hoping to gain size. The Parker Earle comes next, and with us is the most satisfactory of the middle-season kinds. It is not overlarge, of good color and flavor, and has the merit of separating most easily from the stem, leaving the berry in good shape, a quality highly appreciated in the kitchen. Were we restricted to one sort we should select Parker Earle. For a late main crop there seems to be nothing to equal the Gandy. It is always in its best gathering about July 4th; the size is very large, as large as any I have ever seen, not excepting the Marshall, and there is a solidity to the fruit that prevents crushing when it is being stemmed. This is the most robust in constitution of any, and the flowers are rarely injured by frost, owing to the large growth of heavy foliage. We have the Marshall on trial, and this year will prove its merits. It will thus be seen that we depend on three sorts wholly, new ones being well tested before they are planted to supersede them. No garden, however small, should be without at least three sorts, not necessarily those named, but some that suit the locality and the conditions that obtain there.

South Lancaster, Mass.

E. O. Orpet.

The Vegetable Garden.

Peas.—The early plantings of Peas have done remarkably well this year, the cool, showery weather in May promoting a stocky growth, and the yield has been better than it has for several years. The very earliest lots have now almost done bearing and will be cleared to make room for late Celery or Sweet Corn. Successional sowings of such varieties as Champion of England, Telephone, Yorkshire Hero and Stratagem, we have mulched with meadow grass, and during such hot droughty weather as we are now experiencing we allow the sprinkler to run among them every four or five days; it is best to let the sprinkler run at least an hour at each place to soak the ground thoroughly. Peas naturally prefer a rather cool and moist climate, and to have full pods after midsummer we find artificial watering absolutely necessary. Late sowings may still be made of such sorts as McLean's Advancer and American Wonder, and if water can be supplied these will yield a fairly good crop late in the season, but it is useless to plant them on dry ground.

Celery.—The early crop planted outdoors about the end of May should now be growing nicely. To have good Celery, water, and plenty of it, must be supplied. If allowed to become dry at the root the plants are liable to run to seed when the first heavy rains occur. In watering, the plants should have a thorough soaking, and during dry weather, such as we are liable to have during June and July, twice a week is not too often to apply water. As the plants begin to grow more freely assist them by giving a little liquid stimulant at each watering. We find spent mushroom-manure very useful for mulching the plants, but any other fine manure or short lawn grass is helpful. We usually plant our late Celery on ground vacated by early Peas, and we set the plants in double rows in the trenches. The trenches should be liberally supplied with well-rotted manure, and from start to finish the sprinkler or watering-pot should be kept going. Good Celery can only be had by unceasing attention to several details, of which feeding and watering are the chief. We find that Celery keeps very much better in the open ground than when lifted and stored in pits, cellars or outhouses, provided that water will not stand on the land where it is grown. All that is necessary in winter is to earth it well overhead with soil and protect with manure, dry leaves and boards. The finest Celery I have seen for many years in February was kept this way in a private place. Those who have given this system a fair trial have no desire to return to storing methods in general use.

Tomatoes.—Plants under glass, whether in pots or benches, will now need liberal applications of water and stimulants. We usually have plenty of outdoor fruit ripe by July 1st, and then throw out our indoor plants. Fruit grown under glass is so much superior in color, finish and flavor, and commands so much higher prices in the market, that some growers in the vicinity of Boston now grow them under glass the whole summer. Plants on trellisings outdoors will require tying and trimming weekly. From plants set out from six-inch pots we gathered our first dish on June 12th this year, the variety being Ham Green Favorite. So much finer and earlier fruit can

be obtained by training the plants that it is not surprising to see it more generally adopted each year. About July 10th is a suitable time to make a sowing for a winter crop. Nicholson's Hybrid, Chemin, Eclipse (a splendid English sort) and May's Favorite are all excellent forcers, the first-named being the earliest. For general crops, both under glass and outdoors, we consider May's Favorite the finest variety up to date.

Miscellaneous.—Sweet Corn here can be sown until July 10th, unless very early frost occurs. For late sowings we use Crosby Early Sugar or some other early kind. Successional sowings of String Beans can be made at intervals of a fortnight until the end of July. We find Mohawk and Valentine the best. Pole Beans may need tying up a little occasionally until they catch well hold of the poles. Beets for winter use can be sown until the middle of July, Egyptian Turnip being one of the best. Among the long kinds, Dell's Black and Goldie's Exhibition we find are very good. Cucumbers of the English frame varieties require liberal supplies of liquid-manure. Sowings outdoors of White Spine can still be made. Parsley, to produce good plants to lift for winter use, is best thinned out a foot apart in the rows. The foliage is vastly improved by this thinning. Cabbage, Curled Kale, Brussels Sprouts and Cauliflower should be planted out during showery weather. Sowings of Cauliflower and Kale are still seasonable. Lettuces are difficult to grow satisfactorily at this season of the year. Plenty of water and partial shade are essentials to the production of good heads; when headed up, cut the stem half through with a sharp knife; this checks the tendency to run to seed. Leeks can be planted out in trenches and treated like Celery. Set the plants deeply in the ground that the neck may be covered and blanched. Ruta Bagas for winter use are best sown on light sandy ground; heavy wormy ground is ill adapted to their culture. If good Onions are desired supply water freely during dry weather, or the bulbs will ripen prematurely. The hoe or cultivator must be in constant use to keep the ground stirred and weeds in check, and all crops as they are spent ought to be cleared away to the rubbish pile.

Taunton, Mass.

W. N. Craig.

Correspondence.

New Fields in California Fruit-growing.

To the Editor of GARDEN AND FOREST:

Sir,—The chances for pioneering in California fruits are not entirely in the past. What has been true of the lemon, olive and orange is true to-day of the pomelo, pineapple, the fig, and possibly other popular and expensive fruits, all of which can be readily marketed if they can be grown of good quality.

The pomelo is still regarded in California as an uncertainty, dependent for its popularity upon a fad that may not last. The sudden growth of the fruit in favor found California unprepared to take advantage of the unexpected demand. The shaddock, a larger and coarser fruit, was grown to a very limited extent and as a curiosity. Its quality was poor, the fruit being thick of rind, full of "rag" and deficient in flavor. Since it was discovered that pomelos sell readily in eastern cities improvements have been made. The bud of the Shaddock has been grafted upon Orange-roots, and the result is a tree which produces the nearly spherical pomelo, which is far superior to the huge, coarse, pear-shaped shaddock. This nomenclature is the popular, if not the scientific, method of distinguishing these fruits. Some quite extensive orchards of the improved variety have been planted in Southern California, and, with the rapid growth that all such fruits make, the growers will soon know whether they are to reap large rewards in advance of probable competition. [As grown in Florida the pomelo and the shaddock are quite distinct.—ED.]

The pineapple has been successfully grown in some sheltered nooks of San Diego County. The fruit has been marketed at high prices and the growers are confident of success with it. They claim that it is of superior quality. It would seem that so high-priced a fruit would repay unusual care, even to the extent of growing it under glass, if necessary. The markets of the Pacific coast cities have never been overburdened with pineapples, and it is not probable that the limited area adapted to them will produce enough, even for local consumption, for many years to come.

As a commercial factor the fig has been of little importance among California fruits, although it has been an incumbent of almost every rancher's door-yard since the padres taught their Indian peons horticulture. As a fresh fruit it is luscious, and invaluable for its medicinal qualities. Eaten with sugar and cream it is as grateful for dessert as the strawberry and more wholesome. But as it is good only when perfectly ripe it will

not bear transportation under existing conditions, and the fresh figs offered in eastern markets are a delusion and a snare. As a dried fruit it has also been a failure in the market.

Quantities of dried figs are sold in California, although they are usually small and shriveled in appearance and lack the rich, aromatic, nutty flavor of the imported fig. The latter commands in California, as everywhere, a high price, usually twenty-five cents a pound. The home product sells for ten cents. It has been the dream of fig culturists for years so to improve the quality that the California fruit may compete with the imported. To this end soils, climates and varieties have been patiently studied.

The nearest approach to success that I have seen is the product of an orchard grown on very deep, sandy loam, in an interior county, where the heat of summer usually hovers between eighty and one hundred and ten degrees. Moisture is fatal to the successful curing of the fig. Even an adjacent field of alfalfa, with its necessary frequent and copious irrigations, has been found to cause sufficient moisture in the air to turn the fruit sour upon the tree before it could be picked and cured. The Fig-tree is almost a continuous bearer during the producing season, and figs in all stages of development grow upon the same tree. Under the conditions above mentioned only a day or two suffices to spoil the successive relays of fully ripened fruit.

The soil above referred to permits of very exact and careful irrigation in whatever quantity it may be desired, the less the better. After irrigation it is easily cultivated. It does not bake, and a careful pulverizing of the surface keeps the moisture suspended by capillary attraction in the deep porous silt, where the roots of the tree find it, and at the same time it gives a gleaming surface that reflects the full vigor of the sun. As I rode on horseback through a three-year-old orchard grown on this soil the branches were above my head, and had a spread of twelve feet at the top. The largest of the trees were seven inches in diameter a foot above the roots, and, standing without a symptom of scale or any disease, seemed personifications of thrift. The branches were crowded with growing fruit.

The product of this orchard has so far been sold at fifteen cents a pound, dried, to the wholesale grocers of Los Angeles. Packed in fancy boxes, the figs resemble the imported article, with a thin transparent skin and a greater development of sugar than is common in the California fig. The variety is the White Adriatic, which is very large, and has the excellent quality of drying upon the tree instead of falling to the ground when ripe.

The subject of caprifaction has been carefully studied by California fig-growers in the hope that herein may be a solution of the question of quality. But the growers of the Mediterranean are said to be jealous of possible competition, even in so distant a country as California. Consequently frequent attempts to secure colonies of the "fig wasp" for exportation have been thwarted. This is the insect which thrives upon the wild or Capre Fig, and at a certain stage of its fruition enters the domestic fig and deposits the Capre Fig pollen which perfects the fruit. It has long been supposed that this strange operation makes the Smyrna fig so superior in flavor, and, consequently, so much higher-priced than the common fig of California.

Within the last sixty days Mr. George Roeding, a fig grower of Fresno, California, has succeeded in importing from Smyrna thousands of colonies of the fig wasp. Of this importation, Alexander Craw, entomologist for the State Horticultural Commission, says: "I have examined the insects, and find that they are successfully passing from the larvæ into the chrysalis stage. The importance of Mr. Roeding's enterprise to Fig-culture cannot be overestimated. The result of it will be that the California fig will be equal, if not superior, to the fig of Smyrna." Some sixty varieties, including the wild or Capre Fig, and an importation from Aiden, Smyrna, are being tested in the state experimental stations.

There are still other uses to which the fig may profitably be put. It is well adapted to crystallizing. But in this process there are trade secrets not yet understood here. Consequently the French crystallized fruit sells readily at fifty cents a pound, while the California article goes begging at half that price. Delicious marmalades, preserves and sweet pickles may be made from the fresh, fully ripened fig. These are especially fine when given a home-made flavor. The process of picking and either drying or preserving this fruit requires great care, skill and delicacy in handling. It should seem, therefore, that women, if possessed of health, courage and perseverance, might make a success of this industry. The tree is hardy and is not usually afflicted with scale or other pests. Only a moderate capital would be required for an orchard, and the market is a wide one. There is much less risk than in growing oranges or olives. The greatest uncertainty would

be in the cost of the finished product, which might make it too high-priced. But with the constantly increasing demand for delicacies of this sort there ought to be a satisfactory market for meritorious goods.

Redlands, Calif.

William M. Tisdale.

Meetings of Societies.

Convention of Nurserymen at Indianapolis.

THE twentieth annual convention of the American Nurserymen's Association was held at Indianapolis on the 12th and 13th of June. About 150 members were present, a larger attendance than was expected, as there are few nursery firms in Indiana. But Indianapolis proved to be a good gathering-place, and although the central Mississippi states were most fully represented, there was a good attendance from the east and south.

In welcoming the nurserymen to Indiana, Governor Matthews urged the importance of reforesting various parts of the state, and called attention to his advice upon the subject in his last message to the Legislature. Professor F. M. Webster, of the Ohio Experiment Station, read a vigorous paper upon the San José scale in the east, in which he gave a history of its introduction here and a brief account of its habits. The greater part of the paper, however, was a discussion of the necessity of greater care in the dissemination of nursery stock, and the need of stringent laws for the suppression of such pests in the future. He boldly criticised the action of certain nurserymen, whose names he mentioned, for their neglect to take radical measures to stamp out the scale on their grounds. The association endorsed this criticism by a formal vote of approval. Professor Bailey, being called upon, said that he, himself, had little fear of the scale, for he had observed that insects do little harm if they are dead, and we have a ready means of killing this pest with a strong wash of whale-oil soap. Neither was he in favor of laws for the suppression of insects of this kind or of the general types of fungous diseases. It would be next to impossible to frame practicable laws that would be effective; and inasmuch as the enforcement of such laws rests almost wholly upon public knowledge and sentiment, he would prefer to trust to the diffusion of knowledge than to the enactment of law.

The Japanese Plums were warmly commended by W. F. Heikes, of Alabama, who found them to be hardy and productive. He seemed to prefer Abundance and Burbank, but thought well of Willard, Yellow Japan, Normand and Kerr. R. C. Berckmans, Georgia, spoke in the highest praise of these Plums, as a class, for the south, and also said that they are receiving commendatory reports of them from customers in south Africa. Other persons, from Illinois and other parts of the Mississippi valley, reported that these Plums bloom too early and lack hardiness. It was evident from the discussion that the varieties and nomenclature of these fruits were not well understood.

A thoughtful paper upon "The Testing and Introduction of New Varieties of Fruits" was presented by C. L. Watrous, of Des Moines, Iowa, in which it was urged that greater attention be given to the adaptabilities of varieties to particular geographical regions, and that the indiscriminate introduction of novelties should be curtailed. Every distinct life zone or geographical area has needs which can, undoubtedly, be best met by varieties which originate in that area. Mr. Watrous does not believe that varieties can be thoroughly tested before they are introduced, because to test them in all places is virtually to introduce them. The remedy for the present flood of unsatisfactory varieties is more thoughtful care, on the part of introducers, respecting the varied needs of the different parts of our great country.

Professor L. H. Bailey, in speaking of "Reflective Impressions of the Nursery Industry," said that the staple varieties of the nurseries are not necessarily the best varieties for the fruit-grower. The nurseryman's ideal of a variety is one which is a good grower when young, but many of the poorer growers are the best bearers and often give the most profitable fruit. Every one is ready to admit, probably, that the Baldwin Apple has been planted too freely, and the Canada Red and other wayward growers too little. The trouble is that our conception and definition of a first-class tree—that is, a first-class tree in the nursery, for sale—are at variance with truth. We define a first-class tree to be one which is straight, smooth, tall and stocky, but very many good varieties will not grow that way. A truer definition would be that a first-class tree is one which is healthy and well-grown, and which has the characteristics of the variety. The speaker thought it time for the nurseryman to begin to educate the people to the necessity of

choosing varieties with reference to their ultimate behavior, rather than to place so much emphasis upon the mere form or comeliness of the young tree in the nursery; but the first means of spreading this knowledge is the growing of a wider range of varieties which are adapted to particular needs and areas, for, at the present time, the buyer finds only a comparatively small list of established varieties from which to select. Some of the barrenness of orchards may be due to the want of proper selection of buds or cions when the trees are propagated. Every tree has an individuality or habit of its own, and it is not natural for some trees to bear as heavily as others. Cions tend to perpetuate these individual characteristics. He would therefore discourage the use of buds or cions taken from nursery stock, and he suggested that it might be a safe stroke of business for a nurseryman to propagate his stock from bearing trees of known history, and to let the fact be known.

N. H. Albaugh, Ohio, spoke upon Peach Culture, emphasizing the importance of good, clean, yearling stock, and careful attention to digging out the borer. A Peach-tree may be expected to give a good crop when four years planted. The Sneed is undoubtedly the earliest peach known, a conclusion which was sustained by other members. It is over a week earlier than the Alexander or Amsden. It is thought to be an offshoot of the Chinese Cling type. Specimens from Tennessee were on exhibition. Mr. A. Willis, of Kansas, after having tried many ways of increasing his retail nursery trade, found that the most effective way is to send a live agent after orders. This conclusion seemed to meet with the approval of the association.

The officers for the ensuing year are Silas Wilson, Atlantic City, Iowa, President; George A. Sweet, Dansville, New York, Vice-President; George C. Seager, Rochester, New York, Secretary; N. A. Whitney, Franklin Grove, Illinois, Treasurer. The association meets next year in Chicago.

The Boston Rose and Strawberry Show.

ROSES in eastern Massachusetts have been unusually poor this year. The season has been a trying one to them, as it has to all sorts of hardy plants. The dry summer of 1894 was followed by a cold winter, introduced in November by an ice and wind storm of unparalleled severity that worked havoc with trees and shrubs. Great heat in the early days of May, when the thermometer recorded over ninety degrees, Fahrenheit, was followed in the same week by killing frosts, which were probably the direct cause that the flowers of hybrid Perpetual Roses were not abundant and well formed in that part of the country. The severest drought that eastern Massachusetts has felt in the month of June has not improved the Roses, and gardeners have certainly every excuse for their lack of success this year. But if the flowers were poor, there was all the more reason why they should have been tastefully and properly displayed. The Massachusetts Horticultural Society has long enjoyed the deserved reputation of keeping well up with horticultural progress, and it is a new departure for it to take a long step backward. Twenty years ago the society inaugurated in this country the system, which had previously been adopted in England and France, of requiring exhibitors of roses to arrange their flowers in boxes covered with moss, which hid the tin tubes that held the flowers, and furnished the best possible background to display the form and color of the individual blooms. This plan, which is practiced in all foreign exhibitions, made the Boston Rose shows attractive and popular, and did a great deal to stimulate the cultivation of the queen of flowers all over the United States. After a number of years some Massachusetts exhibitors objected to the cost of the boxes and the trouble of procuring the moss, and persuaded the society to assume the responsibility of supplying these adjuncts to the exhibitions. This year the committee of arrangements, finding that it required some trouble and foresight to secure a good supply of fresh moss, did away with the boxes altogether, and allowed exhibitors to show their flowers in small glass vases. Under these conditions the best roses in the world, in competition with the ordinary lots shown in Boston last week, would not have been worth looking at if these had been arranged on moss. As it was, flowers half-drooping on their stems, facing some in one direction and some in another, the small white paper labels almost indistinguishable on the white cloths of the tables, sometimes in front and sometimes behind the vases, or with no labels at all, did not make an interesting or instructive exhibition.

Among flowering plants the best and most conspicuous exhibit was a large bank of well-flowered, healthy Orchids, principally *Cattleya Mossiae* and *Miltonia Phalaenopsis*, exhibited

by Mr. John L. Gardner, of Brookline. This group was tastefully arranged with small plants of *Cocos Weddelliana* and *Maidenhair Ferns*, and produced a really charming effect. The Botanic Garden of Harvard College exhibited a large and exceedingly interesting collection of flowers of hardy herbaceous perennials, and Miss C. N. Endicott and Miss C. E. Hewitt showed 109 species of wild native plants in flower, including a number of alpine species from the White Mountains, not often seen on exhibition tables or by the dwellers in cities.

Strawberries generally showed the effects of the severe winter and May frosts. Mr. J. S. Fay, however, whose Roses were by far the best in the exhibition, as they have been now for several years, sent from his wonderfully productive garden at Wood's Holl, on Cape Cod, a basket of Marshall berries that in size and color were as remarkable as any strawberries we have ever seen.

Notes.

Coreopsis grandiflora has become one of the most popular of the yellow summer flowers, and large masses of them are now among the most conspicuous features of the florists' windows.

Owing to the abundance and good quality of tomatoes now arriving from the south and other points near by, those grown in hot-houses command only fifteen cents a pound at retail. New artichokes are coming in from southern France. Nearly all the staple vegetables are now coming from Long Island gardens.

Exhibits of wild flowers have made conspicuous features at several of the Rose shows lately held in Oregon. In Portland, the abundance and beauty of these exhibits of native flowers are said to have surprised the visitors by their attractiveness, and at Salem there were nearly five hundred collections on exhibition, one exhibitor, Miss Catharine Beckner, showing ninety-five varieties.

The Swamp Magnolia, or, as it is sometimes called, the Laurel Magnolia, is now flowering in Central Park, and the beauty and fragrance of its globular white flowers, set in the thick, deep green foliage, attract a good deal of attention. After the flowers fall the conical fruits, which are green first, soon become rosy-pink, and as the carpels split open they show coral-red, berry-like seeds. The leaves hold on late in the autumn, so that it is among the most attractive of our smaller native trees all the year through.

In a bulletin prepared by Mr. U. P. Hedrick, of the Michigan Experiment Station, it is stated that there are over a hundred and fifty named varieties of native Plums scattered throughout the country, and experimenters are annually introducing new seedlings. These have been classified into groups, and lines with some accuracy have been drawn about them, but the intermediate forms have become so numerous, owing to natural crosses, that it is difficult to make any classification. The fruit of some of these varieties comes into market three weeks before those of the European varieties. The trees are not particular as to soil, and large growers who want a variety of fruits, and the general farmer who likes trees which are free from diseases and from insects, will make no mistake in planting such varieties as Wild Goose, De Soto, Miner, Rolling-stone, Weaver and Newman. To our own taste there is a sprightly flavor about some of these wild plums which is not to be despised even when compared with the more refined, but somewhat characterless, taste of the best European and Japanese varieties.

The June number of *The Forum* contains an interesting article by Mr. E. V. Smalley on the Future of the Arid West. In speaking of the enormous area between the Rockies and the Sierra, he says that we ought to give over deluding ourselves with the idea that this vast vacant expanse is to be the reserve land for future generations to fill up, just as the fertile plains east of the Mississippi have been filled. In the narrow bottom-lands where there are running streams, which make irrigation possible, strips of land can be reclaimed which will yield an immense quantity of forage, grain and fruit, and ultimately these valleys may present the appearance of continuous towns from one end of the canals to the other, while the facilities for social intercourse, education and interchange of thought will develop in these dense settlements a high grade of rural civilization. But we must not lose sight of the fact that these will always be separated by broad areas of irreclaimable lands, which will be useful, at the best, for pasture, and in some regions will remain an absolute desert. In order to show the proportion of reclaimable land to the entire area Mr. Smalley makes the following striking comparison: A single furrow run across a twenty-acre field will repre-

sent all the area that can ever, by the largest enterprise and most liberal expenditure, be rescued for cultivation in this arid region. The remainder of the field will represent the area that will always remain in its present condition, the realm of romance and adventure and hardihood, from which the cowboy, the hunter, the prospector and the pack-train will not soon disappear.

Some years ago the Federal Government expended \$60,000 in planting Beach Grass along the ocean side of the tip of Cape Cod, in an effort to prevent that drifting inward of the beach sands which threaten Provincetown with entire destruction. But the work was undertaken upon too small a scale, and the inhabitants of the town did not realize that the growth of the grass would have to be fostered, so that most of it has perished and the advance of the sand drifts continues. The state of Massachusetts has, however, now taken the matter in hand, through its Harbor and Land Commission, and Mr. Leonard W. Ross, of Boston, has been retained as advisory forester. Mr. Ross proposes to adopt expedients similar to those successfully begun more than a hundred years ago to save lands on the shore of the Bay of Biscay; and expense will not be spared, for the harbor of Provincetown is the only one that affords shelter to mariners along many leagues of stormy coast. His method will be based upon that by which Nature herself once defended the point of the promontory. Her thick plantations of Beach Grass were backed by low forests of Pitch Pine, which were cut off for fuel by the early settlers. These will be renewed, and, according to the Boston *Transcript*, a nursery has been already established for the propagation of the Scotch Broom, Genista Scoparia, which, with Silver Poplars, White Willows and Locusts, and an undergrowth of smaller plants, will be used to form wind-breaks. Austrian and Scotch Pines will be tried, and also the Maritime Pine, the Alder, the European White Birch, the Hornbeam, the Cockspur Thorn and the Tamarix.

Red currants now make a pleasing show among small fruits in market, and red and blackcap raspberries, from Maryland and New Jersey, are already plentiful and cheap, though the earliest ones began to arrive only a few days ago. Blackberries and huckleberries from North Carolina cost twelve cents a quart. Green gooseberries are even cheaper, but strawberries of good quality, now that their season is nearly ended, command twenty cents a quart box. New apples, Astrachans, from Georgia, are already in market. Watermelons are abundant, one hundred and sixty-two car-loads having come here from Florida and Georgia during last week. They sell for fifty cents, while selected muskmelons bring fifteen to twenty cents each. Twenty-two car-loads of California cherries, peaches, plums, and a few pears were sold here last week. Some boxes of large Tragedy prunes were bid up to \$6.00 at the wholesale auction, this being the only blue plum now offered, except the small Koning Claudio. The showy Japanese Botan plum is coming from California and from Georgia. Those from the western coast are larger, of more even size, and bring considerably higher prices. The fruit is a dark yellowish-red, with white bloom and of delicious flavor. The Royal, considered the leading apricot in California, makes up the bulk of this fruit now coming here. This old French variety, which has long been a favorite for canning and drying, is of a dull yellow color with an orange cheek faintly tinged with red. Another variety now offered is the large early Montgamet, a new kind distributed a few years ago by the California Nursery Company. This promising fruit sells for \$1.00 a box more than the smaller Royal.

Hugh Francis Clarke Cleghorn, M. D., died in his home at Strabithie, in Fife, Scotland, on the 19th of May last. In 1854 he was appointed Professor of Botany in the Madras University, and was exceedingly active in laying the foundation of the Indian Forestry Service, the inception of which was due to his zeal, intelligence and executive force. Dr. Cleghorn was the first Conservator of Forests of the Madras Presidency, but left India in 1869 and returned to Scotland, where he filled for a short time the chair of Botany in the University of Glasgow. He retained his interest in botany and arboriculture until the end of his life, and was an active member of the Scottish Arboricultural Society, which he served as president for several years, and of the Edinburgh Botanical Society. In 1861 Dr. Cleghorn published in London *The Forests and Gardens of South India*, a work abounding in practical information. He was also the author of a large number of papers upon botanical and dendrological subjects and of a number of biographical sketches of famous botanists. The genus Cleghornia, of the Dogbane family, established in his honor by Wight, is now referred to Baissea.

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLES: —The New York Botanical Garden.....	261
The Persimmon. (With figure).....	262
Early Summer in the Pines.....	Mrs. Mary Treat. 262
Notes upon <i>Corylus rostrata</i> and <i>C. Californica</i>	Professor J. N. Rose. 26
FOREIGN CORRESPONDENCE: —London Letter.....	W. Watson. 26
PLANT NOTES:	264
CULTURAL DEPARTMENT: —Best Time for Transplanting.....	F. H. Hosack, M.D. 264
Greenhouse Celery.....	Michael Burker. 260
Som. Good Hardy Perennials.....	Robert Cameron. 267
Hardy Nymphaeas.....	J. N. Gerard. 267
Nott's Excelsior Pea.....	W. R. Smith. 268
CORRESPONDENCE: —Poison Ivy.....	W. H. Harrison. 268
Figs in Buffalo, New York.....	John Chamberlin. 269
Witches' Brooms on Cherry-trees.....	F. C. Stewart. 270
RECENT PUBLICATIONS	270
NOTES	270
ILLUSTRATION: —Persimmon-tree, <i>Diospyros Virginiana</i> , near Auburn, Alabama, Fig. 38.....	265

The New York Botanical Garden.

THE managers of the New York Botanical Garden have received by subscription the fund of \$250,000 which it was necessary to raise in order to secure the appropriation of 250 acres of land in one of the parks north of the Harlem River and the erection of buildings there by the city. Professor Britton, who is Secretary of the Board of Managers, has written a circular letter calling the attention of the public to the fact that the original plan of procuring half a million dollars or more as an endowment has not been abandoned, and that it is their desire to enlist popular interest in the enterprise and to receive pecuniary aid from any source. He adds that the development of the garden, after the grounds are laid out and the buildings are completed, will require a large annual income for many years, and since it is expected that this income will be derived mainly from the investment of the money contributed, there will be use for all that can be raised, and subscriptions of any amount will be welcomed.

Professor Britton does well to emphasize the fact that there will be use for all the money that can be obtained if we assume that New York is to have a garden worthy of its rank as chief city of the New World. The Royal Botanic Gardens at Kew, which are recognized as the leading institution of this kind in the world, cost \$80,000 a year, although the botanic garden proper covers only seventy acres, and the labor employed can be secured at half the amount it costs here, while all supplies are correspondingly cheap. The income from \$250,000 will cover but a small fraction of the expense of such a garden as we hope to see in this city; but there must be a beginning to all things, and the men who have subscribed this amount will be gratefully remembered by the city for their liberality and public spirit. The large sum already given proves that the men who have contributed to it are thoroughly in earnest, and that it will be their aim to build up in the city a great scientific establishment; and if they have clear and correct ideas as to what such an establishment should be there are among its incorporators enough men of administrative force to carry it forward to a successful future.

Of course, such an institution must grow into well-rounded proportions from comparatively modest beginnings. It is impossible at the outset to provide a completely

developed establishment, well manned and equipped, for active usefulness. But, in order to reach such a stage, it is essential at the beginning to have a well-defined plan in which the lines of future growth are plainly laid down, for a botanic garden is the last thing in the world whose future can be safely trusted to any chance. Great care should be used in selecting the site, which is the physical foundation of the scheme, and its framework should be made with a clear apprehension of what its probable expansion will be in any direction. The modeling of the grounds, the location of the buildings which are needed immediately, and of those which will be required as material accumulates, will, no doubt, be made a subject of profound study. If this initial work is wisely done, and the plans, with their descriptions, are published, a stronger appeal for pecuniary aid can then be made than is now possible, for if these plans meet the hearty approval of men of science and of affairs so that liberal-minded patrons can have renewed assurance that the garden will be an institution of high scientific value and an object of genuine civic pride subscriptions will be, without doubt, forthcoming. The management should, therefore, not be discouraged if their fund grows slowly at first. Indeed, they ought rather to be stimulated by the prospect to begin the work of design with new heart and hope.

We have laid stress upon the scientific value of the garden, for, although "the prosecution and exhibition of ornamental and decorative horticulture for the entertainment and instruction of the people" is laid down as one of the purposes of the garden in the act of incorporation, it is not to be a pretty flower garden merely or primarily. It was the value and reputation of the collections which Sir William Hooker brought to Kew more than fifty years ago, his great botanical library and herbarium, as well as his own scientific standing, which attracted the attention of naturalists in every part of the world. The scientific spirit which characterized his administration and that of his still more renowned son, and which still prevails under the broad management of the present director, Mr. Thisselton-Dyer, is what gives to Kew its leading position among the botanic gardens of the world. The Royal Gardens are not a mere pleasure ground with showy flowers to please holiday makers, but they are the headquarters of a great scientific organization, which is felt, by its publications and exchanges, not only throughout the great British Empire, but through all the known globe, and even to the most inaccessible parts of the earth. From these remote and unexplored regions travelers and missionaries are sending seeds and plants to Kew, not only to enrich the pleasure gardens of the world, but they are widening the domain of scientific truth and disseminating knowledge which exerts a direct influence upon the world's trade, commerce and general economy. While it is the aim of the administration of Kew to make it beautiful, and to fill its borders and conservatories with attractive and picturesque vegetation, this does not overshadow the stern utilitarian and scientific purpose which reigns there, and the study of plants, for their uses in medicine and the arts, for food and fabrics, is never neglected or treated as a subordinate matter. It is the investigation of plants, the study of their life histories, which gives new value to them in the general economy of life, and it is by the help of such an institution that botanic researches into the secrets of plant-life can be made with the most hopeful prospect of results which will be of benefit to the race.

But Kew had been a garden for a century before Sir William Hooker was placed in charge in 1841, and ever since then it has been developing on the plans laid down by him and the landscape-gardener Nesfield. It has taken fifty years of the best scientific direction, with the resources of the British Empire behind it, to bring the Royal Gardens to their present condition. The gradual building up of a great library, herbarium and museum, the gathering of representative plants from the tropical floras of the world, the establishment of collections of hardy perennial and

annual plants, with rock-gardens, alpine gardens, aquatic gardens, shrubberies and arboreta, are not only the work of time, but the product of thought. To build up and maintain an establishment so vast and complicated requires original ability of the first rank, with thorough training added. Nevertheless, it is possible to make a better garden than any one the world has yet seen. And this is why it is so important to realize at the very threshold of the work the difficulties to be met and the necessity of securing the highest attainable scientific and executive talent. If the design of the garden shows breadth, originality and a full appreciation of what it ought to become, it will, without doubt, command all the aid it deserves, not only from private subscription, but from city and state appropriations.

The Persimmon.

MORE than one hundred and fifty species of *Diospyros* are now known to botanists, many of them inhabitants of tropical Asia, Africa, South America, Mexico and the region bordering the Caribbean Sea. The beautiful variegated Coromandel-wood is produced by two species from Ceylon, and the ebony of commerce is derived from species which inhabit India, western Africa, Mauritius and Malaya. Only two species exist in eastern North America, one of which is the Black Persimmon, *Diospyros Texana*, a tree with intricate branches, often growing to a height of fifty feet, with a trunk twenty inches in diameter. It reaches its largest size in Nuevo Leon, between the Sierra Madre and the Gulf of Mexico, and it abounds in western and southern Texas near the coast. It has never been planted for ornament, but its dark glossy foliage and black fruit make it an attractive tree.

The common Persimmon, *Diospyros Virginiana*, ranges throughout the country east of the Alleghanies as far north as New Haven, Connecticut, and west of the Alleghanies from the valley of the Colorado River, in Texas, to southeastern Iowa and southern Ohio. When grown in the open ground it becomes a tree forty or fifty feet high, with a trunk rather more than a foot through and a round-topped head, and spreading and sometimes drooping branches. Under favorable forest conditions in the Mississippi basin it sometimes reaches a height of more than a hundred feet, with a slender trunk free from branches seventy or eighty feet long. One of these trees standing in the old arboretum of Kew, which was presented by the Duke of Argyle to George III., is still growing, apparently as contented as in its native habitat, and measures more than sixty feet in height, with a spread of about thirty feet, and a trunk which girths five feet four inches, breast-high. The specimen in our illustration, p. 265, which stands in an old Corn-field near Auburn, Alabama, is a tree of about the same dimensions as the one in the Kew Arboretum. It is a graceful tree, and the photograph by no means does it justice.

The fruit of the Persimmon ripens in midsummer near the Gulf, but does not mature until late in autumn in the north, and hangs on the branches until after heavy frost. It is an inch to an inch and a half in diameter, although it varies much in different parts of the country and on different individual trees, not only in size and shape, but especially in quality. The early explorers in America found this fruit used by the Indians and were glad to avail themselves of it and pronounced it pleasant and somewhat luscious, although they discovered that when not fully ripe "Pessimmins were harsh and choaky and furred in a man's mouth like allam." The variability of the fruit and its improvement by selection and cultivation have brought it recently to the attention of nurserymen, and many varieties are now propagated and sold in different parts of the country, so that it seems destined to become a genuine addition to our orchard fruits. We are not aware that any successful efforts at crossing our native species have been made, or that it has been hybridized with the so-called Kaki, which has been cultivated for generations as a fruit-tree in Japan, where trees are found in

every garden, and where a hundred varieties, at least, are now named and recognized. *Diospyros Kaki*, or a species much resembling it, is hardy in Peking and in the highlands of central Japan, where the climate is quite as trying as that of New England, and there seems no reason why plants of this northern strain should not succeed in our middle states. At all events, by hybridizing it with our native species we might hope to secure native fruits of high flavor and ornamental trees of great interest, for the Kaki, with its lustrous leaves and large bright-colored fruit, which is not equaled in beauty by any other fruit grown in north temperate climates, would add greatly to the interest of our rural landscapes. As an ornamental tree, our native Persimmon certainly deserves attention, not only because of its pale orange-colored fruit, but because it is adapted to a great variety of conditions from light, sandy soils to deep rich bottom-lands. Its habit is good, its leaves are large and glossy, its fruit is ornamental, and it is subject to comparatively few diseases or insect enemies.

Early Summer in the Pines.

MY record shows that many plants are two weeks later in flowering this season than they have been in all the years since I have taken notes in the Pines. *Kalmia latifolia* is now just in its prime, so is *Magnolia glauca* and *Itea Virginica*. *Viburnum nudum* is full of bloom, and its relative, the common Elder, is handsome with its great flat cymes of flowers. The Holly, too, is in bloom, with last year's berries still thickly clinging to the twigs, but most of the old foliage has fallen and given place to the new lighter green leaves which will gradually take on their deep dark hue. *Ilex verticillata* and *I. laevigata* are also in flower, as well as the Inkberry, *I. glabra*. I have several plants of the Inkberry in my wild garden, and so far have failed to find any staminate flowers, and yet my plants fruit freely. It is a mile or more to the nearest plants in the Pines, so that insects must take quite long trips to carry the pollen.

The fruit of the Shad-bush, *Amelanchier Canadensis*, is fully ripe, and some of the bushes are highly ornamental. The dark blue fruit of the Tupelo is also ornamental, and has a pleasant acid taste which is very grateful, especially on a warm dry day in the Pines when no drinkable water is at hand. The Staghorn Sumach, *Rhus typhina*, and *R. glabra* are in bloom, and for the first time in several years the flowers have escaped the ravages of the rose bug. This pest is at last disappearing from our neighborhood. I have noticed comparatively few bugs on some of the Roses; everything else is unmolested. No one out of the infested district can realize the thankfulness we feel in being delivered from this scourge. Not only were our flowers destroyed, but the creatures ate the stems of plants. Strong stems of Hollyhock and Hibiscus were cut down, and green apples, peaches and plums were devoured, and not a Grape blossom escaped them that was unprotected.

A good many herbaceous plants are making the Pines gay at this time. In dry, sandy places *Tephrosia Virginiana* and its relative, the wild Lupines, make a brilliant mass of color. In yellow nothing is more showy and graceful than *Coreopsis grandiflora*, which in places stands so thickly that it excludes everything else. Some of the Lysimachias, too, are in flower, modest attractive plants with handsome foliage and pretty blossoms. *Aletris*, with long spikes of tubular flowers and a thick rosette of lily-like evergreen leaves, is abundant in many places. Both species of *Chimaphila* are here, with handsome, fragrant, waxy-looking flowers, which, together with their foliage, make most charming table bouquets. In wet places the Pickerel-weed is showing its long spikes of blue flowers, and the Orchids, *Calopogon pulchellus* and *Pogonia ophioglossoides* are also beginning to show their handsome flowers.

I have not mentioned among the foreign plants which have taken up their abode with us *Galium verum*. Indeed,

I have seen it for the first time this summer. It is a relative of *Sherardia arvensis*, which I recently mentioned in one of my notes of the Pines. This *Galium* has bright yellow flowers, larger and more numerous than most of the *Galiums*, but it is not a strong rampant grower like the foreign *G. Mollugo*. The flowers of the two species, however, blend nicely, and look airy and attractive in this hot weather.

Asclepias obtusifolia is in blossom, and has a singular effect on many insects. Within the horns of the flowers we often find lifeless small flies and tiny bees, and sometimes honey-bees are held fast by the feet until they die, and the most vigorous shaking will not loosen their hold. But the most curious thing is the way in which some beetles are affected by the milky juice of the plant. A handsome little beetle, red and black in color, half an inch or more in length, of the Capricorn form, with long-jointed antennæ, punctures the stems with its strong jaws, and sips or laps the copious juice until it falls down apparently dead. But it is not dead, and after a while it recovers as if from a drunken frolic. I had some of these recovered drunken beetles confined in the house for two days, and then gave them a fresh plant, and, like some higher animals, they got drunk again.

Vineland, N. J.

Mary Treat.

Notes upon *Corylus rostrata* and *C. Californica*.

THE Division of Pomology, in the Department of Agriculture, has been preparing a Bulletin upon "Nut Culture in the United States." This bulletin, which will soon appear, will contain figures and descriptions of the most useful native or introduced nuts of this country. In the study of the Hazel-nut much interesting material was collected, and through the kindness of Mr. William P. Corsa, I have been able to examine it. In comparing our common long-beaked species with its western variety I have become convinced that they are specifically distinct. The so-called variety *Californica* differs from the true *Corylus rostrata* in a number of marked respects.* *C. rostrata* is much less pubescent, sometimes nearly glabrous, while in the western form the branches and petioles have pilose hairs, sometimes gland-tipped, intermixed with a denser shorter pubescence; the leaves are pilose and somewhat rough above and generally densely villous beneath. In *C. rostrata* the leaves are of different shape, thicker and more strongly reticulate beneath, and not at all acuminate. It has a smaller involucre with much longer beak, and the nut of *C. rostrata* is nearly oval, of a dull brown color and a very thin shell. In the other species the fruit is often oblong and larger, generally of a darker brown color and a very thick shell. These are the most striking characters, but there are also slight differences in the stipules, in the toothing of the leaves, and, perhaps, in the habit. *C. rostrata* is generally a low shrub three to six feet high, while the western form sometimes reaches twenty feet, and one case has been reported of a trunk sixty feet long and six inches in diameter; the latter has not an erect stem, however, but is a spreading shoot. The range of these species is quite distinct. The western form is found in the lower mountains and foot-hills, from middle California, through Oregon and Washington, to British Columbia, the type coming from Santa Cruz. *C. rostrata* proper is found in the eastern United States and Canada, extending on the mountains as far south as Georgia and westward to Minne-

* *Corylus Californica* (A. DC.), Rose. *Corylus rostrata* *Californica*, A. De Candolle, *Prod.*, xvi., pt. ii., 133 (1864).—Brewer and Watson, *Bot. Cat.*, ii., 101.—Greene, *Bot. Bay Region*, 304.

Young branches dark brown or blackish, more or less hispid and glandular; leaves nearly oval, slightly cordate at base, obtuse, or at most acutish, roughish above and more or less villous and reticulated beneath, thickish; stipules ovate, obtuse; tube rather short and loose, often flaring, sometimes torn, 9 lines or less long; nut oblong to ovate, 9 lines long; shell brown, shining, very thick ($\frac{1}{2}$ to $\frac{1}{3}$ lines).

Corylus rostrata, Hort., Aiton, Kew, iii., 364 (1789).

Young branches light brown, glabrous or pubescent, never glandular; leaves ovate to ovate-oblong, slightly cordate, acuminate, thin, often smooth above, very pale beneath, nearly glabrous or more or less pubescent; stipules narrowly ovate to linear, acute, $2\frac{1}{2}$ lines long; involucre densely bristly, prolonged into a slender tube above the fruit, 1 to $1\frac{1}{2}$ inches long; nut oval to ovate, 5 to 6 lines in diameter, pubescent when young; shell dull brown color, very thin ($\frac{1}{2}$ line or less).

sota and Colorado. It may extend farther westward, but we have seen no specimens. In the *Botany of California*, however, it is stated that it is found in Washington. The variety *Californica* was first set apart by A. De Candolle in the *Prodromus* in 1864, but the only character pointed out was the difference in the beak. The type was based on the single collection of Hartweg. This disposal of the plant has been followed by Dr. Watson in the *Botany of California*, and by Professor Greene in the *Manual of the Bay Region Botany*. Much material, of course, has been collected since the variety was first established, and a better idea can be formed of its characters.

Department of Agriculture, Washington.

J. N. Rose.

Foreign Correspondence.

London Letter.

ROSES.—This has been a grand Rose season, the display at Kew surpassing anything seen here for many years. I speak chiefly of the species of Rose and such varieties as are interesting botanically. *Rosa multiflora* is a picture, a number of large interwoven bushes being crowded with clusters of white flowers, suggesting a little range of snowy hillocks. By the side of it is what we call the Dawson Rose, one of the hybrids raised by Mr. Jackson Dawson from *R. multiflora* and General Jacqueminot. It is a beauty, the flowers a soft pink, and so numerous on the branches as to positively weigh them down. Another glorious hybrid is the offspring of General Jacqueminot and *R. rugosa*, and which we owe to Mr. Anthony Waterer. In my opinion this is as good a Rose as Crimson Rambler, growing vigorously, flowering with great freedom, and the color of its medium-sized semi-double flowers is a rich bright crimson. It is thought a great deal of at Kew.

Another beautiful Rose, probably a hybrid between *Rosa rugosa* and some other, is named Double de Coubert, a stupid name for one of the loveliest of pure white, large, free-flowering Roses. It has the habit of *R. rugosa*, but is less stiff and the flowers last well. It was awarded a certificate at the last meeting of the Royal Horticultural Society. There is a bed of it in a conspicuous place on a lawn at Kew. *R. grandiflora*, a large-flowered single variety of *R. spinosissima*, has been finer than ever. The Japanese *R. Wichuraiana* is spreading over the ground as though it would cover an acre in a few years. A figure of it has just appeared in the *Botanical Magazine*, where Sir Joseph Hooker reduces it to *R. Luciae*, described by Franchet from specimens collected in China in 1884. It flowers here in August. The Penzance Sweetbrier Roses are again charming. There is a suspicion that most, if not all, of these so-called hybrids are only seedling sports, but, whatever their origin, horticulture owes a debt of gratitude for the possession of a series of varieties of one of the most elegant and poetical of all hedgerow Roses. *R. Californica* is one of the strongest growers and freest bloomers among the many species grown at Kew. *R. Indica* has survived the cold surprisingly well and is now flowering freely, both the single and the semi-double sanguinea varieties being particularly pretty in June. The Himalayan *R. Webbiana* is now flowering for the first time, and the many varieties of the exquisite *R. lutea* are represented by bushes or beds of small plants thickly studded with bright yellow buds and flowers. *R. gigantea* has proved hopeless out-of-doors, and it shows no signs of flower under glass. A garden planted with these beautiful wild Roses, allowed to grow their own way, assisted only by liberal supplies of manure, would be a delightful place in June and July.

LONICERA HILDEBRANDII.—I have already mentioned this strikingly handsome Honeysuckle from the Shan States, Upper Burma, which has been introduced into Kew, where it is now growing vigorously under glass, its stems extending twenty feet or more and clothed with glossy green leathery ovate leaves eight inches long and five inches wide. The flowers are the largest of all Loniceras and of

a rich red color. So far no flowers have been produced by cultivated plants, and I refer to it again now to record its hardiness at Kew, about a dozen seedling plants out of a batch of fifty left out all winter having survived the cold and started again into vigorous growth. A remarkable character in this species is that of the seedlings developing a fleshy bole-like stem or rather base, about four inches long and as thick as a man's thumb. The shoots were all killed down to this thickened portion, which remained uninjured, and from the apex of which the new shoots have sprung.

Two GOOD HARDY AZALEAS are *A. amoena* and the variety of *A. indica* known as *Ledifolia*. They have withstood the severe cold of last winter as well as any of the Japanese plants, and they have flowered with a profuseness surpassing, if that is possible, their behavior when grown in pots under glass. Any one who has once seen these plants out-of-doors in the garden of Sir E. Loder, at Horsham, in Sussex, when laden with flowers, and looking as happy as Heather—happier, indeed, than the latter looked this year after the frost—will not think of again treating them as indoor plants, in the south of England at any rate. It is surprising that these two plants should only recently be proved hardy here, seeing that they have been in cultivation about seventy years. Another variety of *A. Indica*, sent out by Messrs. Veitch & Sons as *The Mikado*, is also quite hardy at Kew. It has sub-prostrate branches and rosy-red medium-sized flowers.

PÆONIES.—English gardens are now aglow with herbaceous Pæonies, which have sprung somewhat suddenly into popularity, owing largely to the many beautiful varieties raised by such growers as Messrs. Kelway, of Langport; Messrs. G. Paul & Son, of Cheshunt, and Messrs. Lemoine & Son, of Nancy. Messrs. Barr & Sons grow them in enormous quantities, and the display of them in the nursery at Thames Ditton is worth going a long way to see. These are preëminently plants for the herbaceous border; they are also most effective when planted in large bold masses on the lawn. At Kew there is a terrace-garden of about a quarter of an acre devoted exclusively to them and the varieties of *P. arboreum*, hundreds of large clumps occupying beds in the grass. The display began with the Moutans last month, and now in the middle of June the grandeur of the herbaceous sorts is such as to attract the attention of crowds of visitors, who are delighted to see a revival of these old-fashioned garden flowers. Many of the new varieties have a powerful and pleasing fragrance which is preferable to the disagreeable odor of the older sorts. There are all shades of color between pure white, yellow and magenta, and a considerable range of variety in size and form. Pæonies prefer to be let alone when once planted, and they like a deep rich loam liberally manured. In dry weather they should be watered freely. The flowers are most useful for room-decoration, lasting well if cut just when the buds burst. Of course, only those that are fragrant are to be recommended for rooms.

ORIENTAL POPPIES are the glory of our borders and wild garden all through the month of June. No plants produce such a show for so small an outlay of money and labor. They flourish in almost any kind of soil, quickly forming large masses of handsome foliage and crowds of enormous bright scarlet cups elevated on elegant stalks well above the leaves. We grow them largely, and there are now several well-marked varieties, some with bright orange-scarlet flowers, others with a large black-purple blotch at the base of each petal, others with flowers of a deep claret color, and others again colored rich crimson. There is no clear line of demarcation between *Papaver orientale* and *P. bracteatum*—at any rate, in gardens—the darker color and the large floral bract by which the latter used to be distinguished being found in some forms of the former. These Poppies are perennial, but they will flower in a year from seed.

SAXIFRAGA PYRAMIDALIS.—This plant is quite hardy near London, some examples of it left in an exposed position in the rock-garden at Kew having passed through the late

severe winter uninjured, and flowered in the first week in June as well as plants carefully grown in pots in a frame. It is by far the best of the Saxifrages for the garden, and many thousands of it are grown in pots for the supply of the London market, a plant in a four-inch pot producing an erect pyramidal raceme of white flowers two feet, or even more, in height. Probably the merits of this plant are well known to your readers, although even here it is not by any means widely cultivated, our friends from the country being usually totally unacquainted with it. To produce tall racemes the plants should be limited to a single crown. It is called *S. cotyledon* by botanists, but the name here given is universal for it by growers.

INULA GLANDULOSA.—A standard English book on garden flowers speaks of the genus *Inula* as “perennial plants of the Composite family, none of which are very important for the garden.” Now, it may be truly said that few Composites are more worthy of a place in the garden than *I. glandulosa*. In the rock-garden at Kew it has occupied a conspicuous position for some years, and every year it sends up a crowd of slender leafy stems a yard long, each terminated by a single flower-head five inches across, something like a Sunflower, but more elegant in the broad silk-like fringe of ray-florets than any Sunflower known to me. The disk, which is two inches across, is a dense bush-like cluster of hair-like stigmas standing above the florets. The color is, however, its chief charm, pure old gold, the color of an Australian sovereign. The flowers last a week or two, and are perfection for room-decoration. The plant is as hardy as a Dock. It is a native of the Caucasian Alps, and has been known in gardens since 1804. A plant of it was certificated this week under the erroneous name of *I. Hookeri*, a widely different species, native of the Himalaya, with pale purplish flower-heads only two inches across. There is a figure of it in the *Botanical Magazine*, t. 6411.

London.

W. Watson.

Plant Notes.

STYRAX AMERICANA.—This shrub, which flowers in the middle of June, is not often seen in our gardens, although few of our native shrubs have a more graceful habit, and when its slender branches are decorated with its drooping racemes of pure white bell-shaped flowers it has a delicate beauty quite its own. In its native habitat it reaches a height of from four to eight feet, and is usually found in low ground and along the margins of swamps, although it will thrive in gardens under ordinary garden conditions. Its range is south of Virginia, but it is quite hardy as far north as New England. The Japanese Styx, *S. Japonica*, is quite as hardy and, perhaps, more showy, since its petals are broader and the flowers larger. They are not borne in racemes, but hang singly on the under side of the branches. *S. Obassia* becomes in Japan a tree twenty to thirty feet high, of graceful form, with leaves more than six inches across, and white bell-shaped flowers nearly an inch in length, and borne in long pendulous racemes. It is a comparatively recent introduction, but it has proved hardy in the middle states, and will, perhaps, be the most valuable plant of the family. It is to be said against these plants that the flowers are quite fugacious, and that they are largely hidden by the foliage, except when borne on stems high enough to give a view of their under side. Judicious pruning when young will give the plants a better form than they naturally assume, which is often too open, but the foliage is clean and lustrous, and they ought to find a place in every considerable collection of shrubs. They are closely related to the Silver Bell-tree, *Mohrodendron Carolinum*, which is easily raised from seed, and upon which they may be successfully grafted.

HEMEROCALLIS FLAVA.—This good old-fashioned plant has just passed out of bloom. It is a native of south Europe, Siberia and Japan. It has been long in cultivation, and is one of our best and most useful plants for the herbaceous

border, and superior to the other species of the same genus, although several of these also are worthy of more frequent cultivation. *Hemerocallis flava* has numerous lemon-yellow flowers, borne on naked stems, which are about three feet high, and they are very fragrant and beautiful in form, color and texture. The leaves are long and narrow, forming a large mass at the base of the plant, which makes a pleasant setting for the bright and showy flowers. Almost any well-drained soil is suitable for this plant; it is not at all exacting in its demands; plenty of room, food and sun are desirable, but not absolutely necessary. It should be planted in masses; in combination with some of the laven-

dens and situations where much care cannot be given; when planted in masses on the edge of a shrubbery it makes an admirable fringe—a most agreeable connecting link between the grass and the shrubs. For this last-named purpose, perhaps, *H. fulva* is even better fitted. This plant, when once established, can successfully contend against almost any encroaching vegetation; witness its endurance about the old house sites on "abandoned farms." The foliage is bolder, the flowers are larger and borne well above the leaves; taken altogether, it is a most effective plant for the wild garden and for those forms of planting where bold effects are desired and where much



Fig. 38.—Persimmon-tree, *Diospyros Virginiana*, near Auburn, Alabama.—See page 262.

der, blue or purple varieties of *Iris Germanica* which bloom at the same time, it makes one of the most telling displays which the hardy garden can produce. Besides this, it is one of the most useful plants for cutting. A large vase filled with the long-stemmed flowers is very imposing. Propagation is by division, either in early spring, just before growth begins, or in autumn, when the leaves are fading. *H. Dumortieri* (*Sieboldii*) has deep orange-yellow flowers, tinged with brown on the outside, which are without scent and are not so tall and erect as in *H. flava*. This species, however, is a strong grower, and, having fine foliage and abundant flowers, is well adapted to those gar-

cultural care cannot be bestowed. The flowers of *H. fulva*, which are dull in color as compared with those of the two other species, open in July; the plant is sometimes called the Mahogany Lily on account of their deep tawny orange hue, well expressed in this name. The common name given to *Hemerocallis* is the Day Lily, shared by this genus with *Funkia* in many places.

IRIS XIPHOIDES (ANGLICA).—This is the English Iris of the garden, a bulbous plant, a native of southern Europe and long in cultivation. Unfortunately, this charming Iris is somewhat tender in exposed places in New England, but if it has a sheltered position, a well-drained soil and a

slight covering of Pine-needles before severe frost, there is no real difficulty in obtaining good results in ordinary seasons. The flowers, which are nearly as large as those of the German Iris, open late in June, or even early in July, and present a wide range of color, from pure white to deep blue or purple, with various shades of yellow intermingled. The foliage is deep green, linear and not overabundant. The bulbs should be planted in October or early November; they are grown in large quantities in Holland and are very cheap; either named varieties or "mixtures" can be used. The cost of the bulbs is so little that, unless the soil and situation is very favorable, it is better to throw away the old bulbs after blooming and obtain a fresh supply annually. The Spanish Iris, *I. vulgaris* (*Hispanica* or *Xiphium*) is very like the English Iris, but has smaller flowers and blooms a week or ten days earlier. It requires the same care and general treatment as advised above for the English Iris; it is, perhaps, a little hardier and more likely to continue in good condition from year to year. The flowers present great variety in colors; some of the dull, tawny yellows and blues are quite by themselves, and are apparently made to suit the artistic tastes of the present day. Some varieties of the Spanish Iris force easily: a pure yellow, Diana; a pure blue, Antelope; British Queen, the Pearl, good white, are among the best for this purpose.

Ostrowskya magnifica is now in bloom at the Bussey Institution in Boston. The plant has been growing in the open air for three years and has bloomed twice. There are two stalks, each with a single flower; the stems are about eighteen inches high, fairly well provided with foliage, which, however, quickly dies away after the fading of the flower. This plant apparently is perfectly hardy and requires no particular care in cultivation, provided the border in which it is planted is well drained, fairly sheltered from cold winds and rather dry in summer. Growth begins soon after the frost leaves the ground. The large campanulate flower (it is described and figured in *GARDEN AND FOREST*, vol. vi., page 274) is quite distinct and is certainly very handsome. The plant is well worth the persistent attempt which seems necessary to establish it in our gardens. Plants are now offered by the Dutch dealers at moderate rates.

Eremurus.—Only one species of this genus has been extensively tested in the United States, although several others are under trial. *Eremurus robustus* has been flowered in many American gardens, and Mr. Endicott and others have described its habits and requirements in our columns. The whole genus, however, is rapidly growing in favor with cultivators of hardy plants, and there are now about thirty species known, most of which have been introduced, but only few of them have become established. Concerning these plants, Mr. Watson writes that failure is generally due to an initial mistake—that is, they are planted in unsuitable positions. In a sunny sheltered border, where the soil is deep and rich and properly drained, they grow well and become permanently established. Once planted they should be left undisturbed, but they require an annual mulch of good manure and the soil forked up about them. In the garden of Professor Foster, near Cambridge, there were lately sixty strong spikes of bloom of various species of *Eremuri*, some of which were seven feet high. The best of the dozen species represented at Kew is *E. robustus*, which has been known to produce spikes ten feet high, their upper third being crowded with star-like pale pink flowers. Next to this in beauty, and on account of its good behavior in the garden, is *E. Himalaicus*, which has shorter spikes of pure white flowers. In Mr. Gumbleton's garden at Queenstown, Cork, this species is a great success, growing freely and establishing itself from seeds like a weed. *E. spectabilis*, with spikes a yard long and yellow flowers, is another good garden plant. Where they are happy these plants are most effective, and they are worth a trial in any garden where the conditions are likely to suit them. They are all Asiatic, all hardy enough to bear the cold of an ordinary

English winter, and most of them can probably be grown with success in our middle states and, perhaps, in New England.

Cultural Department.

Best Time for Transplanting.

PERHAPS no question is propounded to an orchardist, a nurseryman or an editor oftener than "What is the best time to transplant?" unless it be the equally difficult question, "What is the best time to prune?" It is quite as easy to give a wrong answer as to give a right one in either case, no matter which alternative is taken. The truth is, that almost any other point is more important than the time, merely, in the matter of performing any of these operations of the orchard or nursery. Trees, not only small ones, but very large ones, have been moved while in full leaf with entire success by strict attention to the proper conditions; while the opposite result is apt to attend upon their neglect, even with the smallest ones.

If the removal of a tree or plant is so conducted as not to interfere with its supply of nutriment and moisture—the last being the most immediately important—it is certain to take root and grow, with scarcely a check to its growth and future thrift. This has been many times demonstrated, and nowhere more fully and remarkably than at the Chicago Exposition. If full-grown trees of many kinds can be thus taken up and removed without hindrance to their nutrition and growth, it should not be difficult to transplant almost any young fruit or shade trees.

While there is a best time to do almost anything, and while it is not best to remove any tree or plant in dry, hot weather, yet, if it must be done, as in building operations, there is no absolute impossibility about it, and if every incident of the work is made to accord with nature's laws, success is inevitable. As for small trees, even when lightly covered with soil or heeled in, either in fall or spring, and left without attention, they rarely, if ever, die. The reason for this probably is that the work is promptly, even if hastily, done. I have known of trees left so for two or three years, which when planted in the orchard grew quite thriftily. By intelligent pruning these can be brought into good shape. Now, if under such careless treatment successful results are not impossible, how utterly needless is it that any failure should occur under ordinary conditions? Even trees left lying about, uncovered, in the hot sun for a week, in a nursery, have been picked up, buried for a week in moist ground, planted out and brought into health and fruitfulness.

But the possibility of such results is no excuse for careless work. The best of anything is not too good, and the best methods are the most profitable. As to fall or spring planting, when all the work has been timely and carefully done, I have never noted much difference between them. If the work should be done in spring, it is best to transplant as soon as the frost is out of the ground, and in fall as soon as the leaves will strip easily, which is soon after the first sharp freeze.

Newport, Vt.

T. H. Hoskins.

Greenhouse Celery.

THE regular supply of Celery from storage generally runs out about the latter part of April. For a considerable period before this time the stored produce becomes tough and flavorless, losing the brittle crispness which is so desirable in this vegetable. It has long been a problem how this evil might be remedied and the season of good marketable Celery prolonged. Hitherto the strong demand during the summer months has met with no supply, although excellent prices could then be secured. The chief difficulty in the way of greenhouse culture has been in the blanching of the crop. To blanch a plantation by the ordinary process of earthing-up would require a large amount of space between the plants, and this would seriously curtail the profits, and it is questionable if a crop raised under such conditions would yield any profit. Some Celery grown here last year was in excellent condition during the months of May and June, but the plants were too close to allow of earthing-up, and no other system of blanching was then considered practicable. This year again we made another plantation, and our experiments in blanching have been highly satisfactory.

The seeds were sown in shallow seed-pans December 10th, and placed in a temperature of about sixty-five degrees. The seedlings were pricked off into pans January 7th, and after being hardened off somewhat they were finally planted seven inches apart in the solid bed of a house in which the tempera-

ture is kept at about fifty degrees during the winter and early spring months. This final planting took place February 6th. The soil used was that in which Chrysanthemums had been grown up to January, and it was not manured in any way for the Celery. The roof of the house was five feet above the soil. The plants made good progress, and on April 12th were ready for bleaching. We at first tried thin wrapping-paper and two-inch drain tiles, having previously tied up the leaves firmly with raffia. Neither of these materials, however, was satisfactory. The plants rotted in the tiles, and in the paper the leaves damped off to a large extent. The paper might have served its purpose had it been changed and the plants cleaned once a week, but this involved too much labor, and the damping off of the foliage injured the flavor of the Celery. On two other batches of the same crop we then tried wrappers of heavy porous paper, similar to that used for drying botanical specimens, and White's patent Celery blancher. The drying paper had the same defects as the thin wrapping-paper already employed. White's blancher promised better results. This consists of a sheet of heavy, flexible, dark red paper, fifteen inches long by twelve inches wide, with a light wooden slat at one end and in the centre, and a string for tying fastened in the middle of the latter slat. It is certainly a handy device, but, owing, doubtless, to the presence of some preserving chemical in the paper, it had not been adjusted an hour before the leaves of the plants began to shrivel and turn brown, the plants ultimately dying. If the paper were rendered harmless and the slat lengthened at the end by about two inches, with the added portion pointed so that it may be inserted in the soil at the base of the plant, this blancher would be just the thing needed.

But thus far we had failed to get a satisfactory bleacher, and something else had to be tried if we were to secure any good result from our crop. Another lot of plants was accordingly treated with a heavy wrapping-paper, firm in texture and smooth. This had the desired result of bleaching the Celery thoroughly. These bleachers were placed in position May 9th, and the Celery, excellent in flavor, was ready for use May 25th. In this experiment we grew only two varieties—Giant White and Kalamazoo. The latter is of stockier habit than Giant White, and it seems to force and blanch better.

Michael Barker.

Cornell University.

Some Good Hardy Perennials.

CAMPANULA PERSICIFOLIA is an old-fashioned and well-known perennial, and has been grown in gardens for three centuries, but, although cultivated for so long a period, the type and its various forms are numbered among our choicest summer-blossoming, hardy, herbaceous plants. The typical plant has large, broadly campanulate blue flowers. The stems on which the flowers are produced are from two to three feet high, and the inflorescence is a sort of raceme. The leaves on the flower-stems are linear-lanceolate, and the root-leaves are a little broader. In gardens there are many forms of this Harebell to be found, and they are all good hardy plants. A few of the best varieties are the following: Alba is a pure white form, with flowers about the same size as the type, and is more common in cultivation than any other variety of this plant. Alba coronata has pure white semi-double flowers; but the best of all the forms known to me is the one in flower now under the name Grandiflora. This is a distinct plant, with larger flower-stems, larger leaves and much larger pure white bell-shaped flowers than any of the other forms. The flowers of the species and all its varieties are useful for cutting and last well in a cut state. If the flowers are not needed for cutting purposes they should not be cut down after the first crop of flowers are over. If they are left alone a little later they will produce a second lot of flowers which is almost as good as the first ones. None of the varieties of this Harebell are particular about soil or situation; they grow well in any ordinary garden soil, but to get extra good plants they require good rich soil and should be transplanted every second or third year.

In the rock-garden Campanula Portenschlagiana is completely covered with blue flowers. It is a pretty dwarf plant, just suited for this situation, and only grows about eight inches high. The nearly erect bell-shaped flowers are so numerous on the plant that one looking down upon it can hardly see any of the leaves. This little gem comes to us from the south of Europe and has proved hardy here for a number of years.

In the herbaceous border Campanula latifolia macrantha is very handsome and showy at this time. It is a stately perennial and very showy, and should be planted in a conspicuous

position where it will be seen to advantage. It has flower-stems about four feet high, with large flowers of an exceptionally bright purple-blue color. It is a vigorous plant in any ordinary soil. It comes true from seed, and plants are easily raised if the seed is sown in spring.

Let me add a word to what was said last week about the Fraxinella. One might suppose that so interesting a plant as this, after having been in cultivation for three centuries, would be found in every garden, especially since it is one of those which practically never run out if once established in fairly good soil and let alone. I find in Johnson's *Gardeners' Dictionary* that "instances are known where the Fraxinella has outlived father, son and grandson in the same spot." Although the flowers of the white Fraxinella are rather handsomer than the rosy purple ones, the latter plant is much more vigorous. Its flowers are borne on stems more than a yard high, and a specimen which has remained in a good position undisturbed for years throws up strong pinnate leaves, and is very useful where a large mass of foliage is needed during the summer. Both plants do well in a slightly shaded situation. Cuttings grow freely and they make large plants sooner than when grown from seed.

Harvard Botanic Garden.

Robert Cameron.

Hardy Nymphæas.

GROWERS of Nymphæas would feel an enhanced obligation to Dr. Faunce if he would trace the parentage of *N. Laydekeri rosea* one step further, and reveal the male parent. It is evidently futile to conjecture, in view of the revelations which have been made, as to the origin of the hybrid Water-lilies. *N. chromatella* was long supposed to be a hybrid of *N. tuberosa* by botanists, and was named by them *N. tuberosa flavescens*, yet Monsieur Marliac declares its origin as *N. alba* \times *N. flava*. If the botanists are misled, we laymen can scarcely be blamed for being apparently so far astray in our guesses as to the origin of *N. Laydekeri rosea*. From its form, so nearly like *N. pygmæa*, and its peculiar coloring, changing from light to dark red, any one who had grown the two species naturally hazarded the statement that they were the responsible parents. It does not seem to have occurred to any one to venture, at least in print, a possible origin from *N. rubra* until Monsieur Marliac, in *The Garden*, December 23d, 1893, gave this as a grandparent. In this article he says the hybrid between *N. rubra* and a hardy species—name not given—produced no offsets, but a plentiful supply of seed, which, however, produced plants of varying shades of red from soft pink to the deepest shades. These varieties prove useful for hybridizing choice stoloniferous and prolific kinds, and it is from these hybrids that he has obtained the series of hardy hybrids, *N. Robinsoni*, *N. Seignoureti*, *N. Laydekeri rosea*, *N. liliacea*, *N. fulgens*, *N. Marliacea ignea*, *N. Marliacea rubra punctata*, *N. Marliacea flammea*, etc.

Monsieur Marliac has given no indication of the other parents except that he has made crosses with yellow-flowered kinds, and the matter seems to be in considerable obscurity. Dr. Faunce seems to carry the matter a step further in giving *Nymphæa rubra punctata* as one of the immediate parents of *N. Laydekeri rosea*, with the remark that Marliac "has not sold the goose," etc., which is singular in view of the fact that it is an open secret that the stock of this variety, only one plant, or possibly two, if I remember rightly, was offered for sale, while *N. Laydekeri rosea* was being sold at twenty francs a plant and was put out at thirty francs the first season. It is also said that *N. rubra punctata* is as large as *N. odorata rosea*; this being so, it is singular that it should be persistently crossed with something to reduce the size of its flowers, for it can scarcely be meant that it produces self-fertilized seed which give flowers of half the size and of different color from the only parent. The matter does not seem exactly clear, and it is to be hoped that some of our growers with ample space will follow up the points and endeavor to verify the crosses, a pursuit which would be as interesting as profitable if successful.

It would also be interesting to know exactly how hardy the Nymphæas are, and under what hard conditions they will exist or fail. It is certain that many of them will endure some freezing. My *N. alba candidissima* is almost invariably encased in ice each winter, and has never suffered. One of my tanks, which was covered with loose thin boards, developed a fracture last January and became empty and remained so for a number of weeks during the very low temperature then prevailing. There was a sheet of about four inches of ice, which, while it did not prevent cold air reaching the roots, probably furnished some slight protection. Yet, with an outside temperature of zero or less, this protection could not exclude frost, and, later on, the ice disappeared entirely. Under these

conditions none of the hardy *Nymphaeas* suffered in the least, and have since grown as strongly as usual. There were in the tank *N. alba candidissima*, *N. rosacea*, *N. alba rosea*, *N. sulphurea*, *N. pygmæa* and a few seedlings. If some one will relate the conditions under which he has lost his plants, perhaps we may progress toward the discovery of the line of safety. My experience in growing the hardy *Nymphaeas* leads me to let them alone after they are once established and doing well, and not to replant them each season, as I thought necessary when first growing them. My plants are mostly in soap-boxes and are rather crowded in the tanks, quite in the approved amateur fashion. It is not pleasant to work in cold water early in the year, and last year none of the plants which were in good health were disturbed, and this year they still remain in the same earth and boxes. So far they have done finely, and I have never seen better or larger flowers of *N. albida*, *N. alba candidissima*, *N. carnea* and *N. chromatella*. The foliage has been vigorous and satisfactory. The roots were originally planted in rather stiff loam, with a large proportion of stable-manure, and there has been a gradual addition of decaying leaves and vegetation, which has made a layer of a few inches in the tank and probably proves valuable nutrition for the wandering roots. If one has the room, Water-lilies should be planted out where they will be surrounded by ample water-space, under which conditions only are they really effective. But if one has only a small garden and wishes to secure a supply of flowers of the various varieties, the practice I have outlined will prove as satisfactory as it is comfortable. This easy-going practice will not, however, answer for the tropical *Nymphaeas* which have to make a great growth in a short time, and need not only a high temperature, but an abundance of nutriment which can be quickly assimilated. One of the minor results of the water-garden seems to be the almost total disappearance of slugs from the borders and the greenhouse, where the frogs hunt them when not engaged, as they have recently been, in the intensely noisy courtship incident to the season.

Elizabeth, N. J.

J. N. Gerard.

Nott's Excelsior Pea.—I have noticed for several seasons past that the useful Pea known as Little Gem has deteriorated very considerably, and gives a mixture of rank late vines. No amount of selection appears to be sufficient to bring it back to what it once was. This would be a matter of extreme regret if it were not for the advent of another variety which is a considerable improvement on Little Gem, even when it was at its best. I refer to Nott's Excelsior, now catalogued by most of the prominent seedsmen. This variety is only one foot in height; both foliage and pods are of a fine attractive color. It endures drought in a remarkable manner, and is an abundant bearer, every pod being filled tight with the most delicious-flavored peas. In my opinion it is destined to displace not only Little Gem, but almost every other variety of that type. It certainly is worth a trial by every one who grows early dwarf Peas.

Bloomfield, N. J.

W. R. Smith.

Correspondence.

The Poison Ivy.

To the Editor of GARDEN AND FOREST:

Sir,—The genus *Rhus* belongs to the widely distributed Anacardiaceæ or Cashew family, and numbers among its relatives such species as the Cashew Nut, Pistachio, Mastic, Mango and many other plants whose juices and resins form valued dyes, gums and varnishes, and whose fruits, though often poisonous in parts, are highly valued in tropical regions. The leaves, berries, bark, wood and roots of many of them are used for dyeing and tanning, and on account of the malic acid they contain some of them are important condiments.

Rhus Toxicodendron, known as the Poison Ivy and by many other names, is a variable plant ranging over a wide area and having three distinct forms which are connected, however, by every gradation of intermediate growth. The most noticeable of these, although perhaps not the most common, is the so-called *R. radicans* of Linnæus, with smooth entire shining leaves and long petioles. It spreads but little by the root, and the stems are always climbing, being closely attached to some object by innumerable sucker rootlets. It has a wide range, from eastern Asia westward, and its favorite habitat is in damp spots and in woods, where it ascends to the tops of the highest trees, its thickly set horizontal branches being one to two feet long and half-clothing the trunks of trees in open land with a pillar of luxuriant green, and thus rivals in beauty any other plant of similar habit.

The second, and with us the commonest, form (the true *Rhus Toxicodendron* of the older botanists) is the ordinary bush Ivy, which is an ever-present pest, being found in hedgerows throughout large sections of the north temperate zone.

The third form is, so far as I know, distinctly maritime in its habits, being found in dry, almost barren sand along the Atlantic seaboard, and, perhaps, elsewhere. The trunk of this form is always buried, only the sparsely scattered branches rising above the sand without seeming regularity, and appearing like separate plants, each consisting of a slender branchless stem, seldom a foot in height, terminated by two or three pale, thin, sickly leaves. I have seen it covering hundreds of acres on our Atlantic islands and sand dunes, where it was almost the only inhabitant of the drifting sand—so sparse and weak as to hardly deserve the name of vegetation. It was my fortune to live for some time with a colony of sailors upon one of these bare islands where this Ivy composed, perhaps, a third of all the woody vegetation. Though then highly susceptible to the poison, I yet passed daily on foot through long stretches of it, and even lived in it, and though I took no precaution whatever, I did not feel the slightest irritation from it. It was a revelation to my fellow-islanders when I told them of its poisonous properties, for they had never dreamed of such a fact, nor had any of them ever been troubled by the plant. From its enervated appearance I could easily imagine that its desert surroundings had more or less tamed its virulence. If such was the case we may infer, perhaps, that the strength of the poison varies to some extent with the thriftiness of the plant.

The poison of the Ivy, though always present, probably, like all sap, varies slightly in activity with the season, though, perhaps, not more than does man's power of resisting it, for the warm, perspiring skin of summer, with its open pores, takes in and throws out juices much more readily and is more easily irritated than the dry, firm skin and contracted pores of the exposed parts in winter. Aside from the sand form, all parts of the Poison Ivy are poisonous at all seasons, the root being by far the most virulent of all. I have seen a robust physician in the prime of health poisoned almost fatally, and rendered nearly helpless for many days, in spite of all medicines, simply by pulling the roots. The toxic element seems to be volatile, and any part when thoroughly dried becomes wholly innoxious, but when cut with hay the latter will become dry, while the Ivy-stems are still fresh and contain poison. In this condition it is drawn to the barn, where the slowly evaporated poison is absorbed by the surrounding hay, which thus becomes, in a degree, as poisonous as the Ivy itself. Through this means I have known men severely poisoned while taking out the hay in winter. It is owing to this volatilization of the juices that the smoke of burning Ivy or of a brush heap containing it ranks next to the root in the virulence of its poison. Though the effects of Ivy are generally a harmless, but troublesome, irritation, it has been known to prove fatal in some very severe cases, and susceptibility to its influence is by no means desirable, though the irritation is said to be sometimes slightly beneficial in cases of rheumatism. Some persons are never affected by the poison, but each attack renders its victim more susceptible, and some are even affected at times by air that has blown over Ivy, especially if the plant has been recently cut. When boys, my brother and I have mowed in Ivy when our bare feet would be almost black with the dried juice, and we used occasionally to "wash" our hands and faces in its leaves, rubbing them on by the handful, in order to prove our immunity from the poison, and always without feeling the slightest effects. Neither of us would now care to repeat this, as the Ivy has for a long time been poisonous to both of us.

The poisoning, which is of an erysipelous nature, usually appears, in light cases, at the point where the Ivy-juice came in contact with the skin, but severe cases are apt to centralize at some point where the skin is tender. After such a localization is once established each successive attack, if at all severe, is apt to reappear at that point even at times when no irritation is felt where the Ivy was applied. Personally I know of several such cases, and this would tend to show that the poison may be carried in the blood—a theory that is also upheld by the fact that if one has just been severely poisoned he can, to some extent, induce part of the eruptions to appear almost wherever he chooses by keeping the skin locally irritated during the period of incubation.

As the remedies for this poison are so unsatisfactory, I venture a few suggestions gathered from experience. Any scratching or rubbing of the poisoned surface or breaking of the blisters tends to spread and augment the affection. This has led me to adopt a cure that I find to be equal to all ordinary cases, but which at times requires an amount of

physical control and grim determination that might be envied by an Indian. It is to let the poison severely alone—to "grin and bear it"—never under any circumstances allowing it to be rubbed or irritated in any way. Under this treatment the blisters will begin to wither in a day or two, and will soon disappear, and the itching soon subsides, especially if a little cool water be applied to the spot occasionally. Another useful remedy is sour buttermilk (the sourer the better) applied occasionally, and allowed to remain on. A decoction of *Lobelia inflata* is also good as a wash, but should never be taken internally. The mineral water of the famous Lebanon Thermal Spring, situated about a mile from us, is also largely used here with beneficial effect, a single application for an hour or so usually being sufficient for an ordinary attack.

As there is a popular belief that the Poison Ivy has no insect enemies, I may be pardoned for adding that in March, 1894, while digging out some of the Ivy here on our place we were fortunate enough to discover numerous minute galls on its small fibrous roots, each containing an almost microscopic red larva. They proved to be of an entirely new species, and were sent to Professor L. O. Howard, chief of the Division of Entomology at Washington, who placed them in charge of Professor D. W. Coquillett, the division specialist for that class of insects. At our request he kindly described and named them, speaking, in part, as follows: "Up to the present time no case has been recorded in this country of any species of *Cecidomyiidae* living on plants belonging to the genus *Rhus*. . . . The species is evidently new to science, and may be characterized as follows: *Cecidomyia rhois*, n. sp. . . ." The perfect flies issue early in May, and are brownish black in color, slightly marked with yellow and red, and having hairy bodies and grayish wings. The size is very small, being only from 1.5 mm. to 2 mm. in length. The original description will be found in *Insect Life*, vol. vii., No. 4, page 348.

Lebanon Springs, N. Y.

W. H. Harrison.

Figs in Buffalo, New York.

To the Editor of GARDEN AND FOREST :

Sir,—I have a Fig-tree that became a member of the household as a very small pot-plant, a gift from a friend. After a while it outgrew pot-culture and was set in the ground, more to get rid of it than anything else. In the fall it went into a box and was set in the cellar, along with Fuchsias, Hydrangeas and other tender shrubs. It grew very slowly, but always did well, and seemed to enjoy that sort of life, developing into the average Fig-tree, I suppose, a knotty, dark-barked affair, with several stems, the largest nearly four feet high and about an inch through at the ground.

Last spring it set some fruit, the small eye-like blossoms pushing their way through between the scales of the terminal buds in a very novel fashion to one not acquainted with the growth of Figs, the leaves opening some time later. The heavy early rains took all the fruit off, as they did all of the young grapes in the yard. When it began to rain last fall, after the long drought, the ambitious Fig set another crop, out of which seven or eight figs grew to the size of small chestnuts. When the tree was set in the cellar the leaves soon came off, but the fruit remained. During February the temperature was several times below freezing and the more tender plants were all killed, but the figs stood up straight on their stems, and when the tree was planted they began to grow, even before the leaves started. Then a new crop appeared, so many that the tree wisely allowed most of them to dry up. Now the figs of both years are pushing on side by side, none of the setting of last fall having dropped off, and all are about three times as large as when the tree was set in the ground in April. Those of the new crop are about half as large.

Fig-trees are not at all common here, even as tender house-plants, and the behavior of this specimen, though possibly common to the species, is a novelty to many.

John Chamberlin.

Witches' Brooms on Cherry-trees.

To the Editor of GARDEN AND FOREST :

Sir,—In Europe the cultivated Cherries, *Prunus Avium* and *P. Cerasus*, are attacked by a disease which the Germans call Hexenbesen (witches' brooms). The fungus which causes it is closely related to the leaf-curl fungus of the Peach. Formerly it was considered to be identical with the disease on the Peach, but Professor Sadebeck, in a recent monograph,* makes it a distinct species, giving it the name *Exoascus Cerasi*. Although the English Cherry, *P. Avium*, is commonly culti-

* "Die parasitischen Exoascen."

vated in the eastern United States, and has become thoroughly naturalized, the disease was not observed upon it here until Mr. Thomas Meehan reported it from Germantown, Pennsylvania, in 1886. The specimens which he collected were distributed in "North American Fungi," No. 2286, under the name *Exoascus wiesneri*. So far as I can learn it has been found upon the cultivated Cherry in no other locality in America until I found it this spring on Long Island in five different places, namely, Queens, Westbury, Floral Park, Cutchogue and Flatbush. It appears to be widespread on Long Island.

The disease manifests itself by causing the leaves to become reddish and wrinkled before they attain full size. By May 23d the under surfaces of the leaves are covered by a white, mealy layer which is composed of the spore sacs (asci) of the fungus. Dr. Robinson says† that the asci occur on both surfaces, but Professor Atkinson found them only on the under surface in the Germantown specimens. I have examined a large quantity of the Long Island material, and in no case have I found ascii on the upper surface. After the white layer makes its appearance the leaves dry up and fall off in a few days. Later, new leaves come out. The affected branches produce no flowers. Where flower-buds should be found twigs appear instead, and the repetition of this process brings about the "broom."

Probably the scarcity of the disease in America is due to our climate being unfavorable to it. Mr. Meehan states that it does not seem to spread. This is strange, because, according to Mrs. F. W. Patterson,‡ the same fungus occurs in America on *Prunus serotina*, *P. Americana*, *P. Virginiana*, *P. demissa*, *P. hortulana* and *P. Pennsylvanica*. The form on *P. serotina* is common, and why should it not thrive on *P. Avium*?

In case the disease should show a tendency to become troublesome, it could probably be controlled by cutting out and destroying the "brooms" before the spores come to maturity. This can easily be done, the diseased twigs being indicated by the red color at least a week before the spores mature.

It should be remembered that the fungus is perennial in the twigs; hence the disease may be transmitted by grafts.

Jamaica, N. Y.

F. C. Stewart.

Recent Publications.

The Horticulturist's Rule Book. By L. H. Bailey. New York : Macmillan & Co. 1895.

This is the third edition, and a considerably enlarged and thoroughly revised one, of the compendium of useful information for fruit-growers, truck-gardeners, florists and all others who need a hand-book of horticultural reference, which was originally published some six years ago. The book now contains three hundred pages, and costs only seventy-five cents, and yet it would be hard to find another manual which offers so much practical advice as to horticultural details upon so wide a range of subjects. Since the first edition was published a great amount of knowledge has been gained concerning injurious insects and fungous diseases, and the *Rule Book* in its revised form gives all the improved and current methods for dealing with these pests. It contains also practical remedies and preventives of injuries to plants by mice, rabbits, birds and squirrels. We add the titles of some of the chapters: Waxes for Grafting and for Wounds ; Cements, Mortars, Paints and Glues ; Planting Tables, giving dates and directions for planting ; Seed Tables, giving statistics of weight, size, time required for germination, etc.; Computation Tables ; Time of Maturing Different Garden Crops and Average Yields ; Methods by which Various Fruits and Vegetables are Multiplied ; Greenhouse and Window-garden Work ; Methods of Storing Fruits and Vegetables ; Preserving Specimens for Cabinets or Exhibition ; Postal Rates. These are only a few of the leading topics, but they serve to indicate the scope of the work. A list of the names of plants and vegetables in different languages, a good glossary and a complete index help to make readily available all the information in the book, so that the gardener who turns to it for instruction will rarely fail to find what he wants to know, fully, clearly, and yet very tersely, expressed.

† "Notes on the Genus Taphrina," *Ann. Bot.*, i., p. 160.

‡ "A Study of North American Parasitic Exoascomycetes," *Bull. Lab. Nat. Hist. State University of Iowa*, p. 121.

Notes.

Japanese Irises are more than usually abundant and beautiful in the florists' windows this year.

Very striking objects in the landscape just now are the Chestnut-trees with their great dome-like heads covered with cream-colored flowers. In distant woods, where there is an occasional tree of this species, the mass of flowers, surrounded by the green foliage of other trees, has a singularly beautiful effect. Chestnut-trees seem unusually full of blossoms this year, and young ones not more than ten feet high are flowering freely. The odor of these flowers is borne a great distance on still summer evenings, and the fragrance from remote trees is delightful.

Celery is already coming from Long Island, and four stalks bring thirty-five cents. New crop celery, from Kalamazoo, costs fifty cents for a dozen stalks. Chicory, escarole and Roman lettuce come from near-by farms, and besides taragon, chervil, chives and mint, catnip and tansy are kept in stock by the best dealers. Large quantities of these herbs are bought by the saloon-keepers for use in fancy summer drinks. Solid, well-colored tomatoes are coming from Mississippi in refrigerator cars, as many as 4,000 crates being sold at auction by one house on Monday. They bring twenty-five cents a quart at retail.

There are few of our wayside thickets or neglected fence-rows, especially where the ground is rich and moist, which are not beautified now by the flowering of the common Elder, *Sambucus Canadensis*. Its abundance justifies the epithet of Common, and, indeed, it is so familiar that its merits are overlooked by the great mass of people who value plants according to their rarity. But the graceful way in which the broad cymes of white flowers are borne above the smooth and always healthy leaves, and the beauty of its abundant dark purple fruit, make it really one of our most attractive shrubs. Fortunately the birds keep planting it year after year, and it is sturdy enough to take care of itself, so that those who appreciate it will always be able to find it, although no one ever thinks of planting it.

The few strawberries now in market come from western New York and Connecticut, and cost twenty-five cents a quart. Blackberries are plentiful; they come principally from North Carolina, though a few of the small-berried early sorts have already been received from as far north as southern New Jersey. The best huckleberries have been coming from the Carolinas and Virginia, but good ones are now coming from the Shawangunk Mountains. Raspberries are coming from Maryland and the coast country up to Lake Champlain, and cost ten cents for a small cup. Muskmelons from South Carolina cost thirteen cents apiece, the red-fleshed Christina melons costing twenty to twenty-five cents each, while large heavily netted melons from New Orleans command forty to seventy-five cents. Closely fruited bunches of Niagara grapes have been here from Florida and southern Georgia for nearly a fortnight, and sell now for twenty-five cents a pound. The Alexander and Early Rivers peaches from Georgia are now being succeeded by the somewhat later varieties, as Tillotson, Mount Rose, Lady Ingold, a good yellow, somewhat earlier than Early Crawford, and Amelia. These Georgia peaches are better this year than ever before. Along with the few remaining P. Barry pears of last year, which sell for ten cents each, the street fruit-stands now display new Bartletts, Seckels and Buerre Giffards from California, and Le Conte pears from Georgia. Some of the Peach plums from California have brought as much as \$5.20 a crate, a higher price than any other plums command.

At the Geneva Experiment Station, in this state, the forcing of Lettuce in pots has been tried with considerable success, and the details of the practice are given in a late bulletin. Seed is sown in flats as usual, and the seedlings when two inches high are transplanted into two-inch pots, which are plunged into soil on the bench, so that the pots are covered with about half an inch of the earth. The soil in the pots is the same as that used in the benches, except that it is sifted, and both consist of three parts of loam by measure, one of rotted manure and one of sand. The benches are six inches deep, the lower three inches being filled with manure upon which the roots feed after they grow through the hole in the bottom of the pot, which they soon do to some extent, although a little drainage material is put in the bottom of each pot. The pots are set about ten inches apart, although the dis-

tance varies with different varieties, and when they are filled with roots the plants appear to make a compact growth and head more quickly than when grown in beds where the root system is unchecked. One advantage of this method is that the plants are moved but once, and so escape the check of growth which comes from the second transplanting. When ready for market the plant is knocked out of the pot, and since the ball of earth containing the roots is undisturbed it remains moist for a long time, so that the head keeps fresh and crisp much longer than when the roots are disturbed. As soon as a pot is removed from the bench another can immediately be set in its place without waiting to clear the bench, and in this way the method proves economical both of time and space. Cultivators are counseled to avoid sudden fluctuations of temperature, which should be kept at from fifty to sixty degrees during the day and five or ten degrees lower at night, as a higher temperature tends to give a spindling growth, a lack of compactness and greater liability to attacks from aphides. The plants should have plenty of fresh air, especially on sunny days when the temperature is high outside. When watered overhead it is best to select a time when the foliage will quickly dry, and they should never be watered so late in the day that they will not dry before night. Before the pot is plunged in the soil it is turned upside down and the under sides of the leaves are dusted with tobacco to prevent the attacks of aphides. The upper sides of the leaves are then dusted, and about a week later the plants are dusted again, especial care being taken to apply the tobacco thoroughly at the centres of the growing plants.

A comparatively new pest of fruit-trees is the insect called the cigar-case-bearer, which last year probably ranked next to the bud-moth in New York in destructiveness. In a bulletin from the Cornell Experiment Station, Mr. Slingerland says that it has probably been present in limited numbers in the orchards of this state for many years, but public attention was not called to it until 1888, when Mr. Patrick Barry found it boring holes in newly set pear-fruits. In 1892 Dr. Lintner received some apples from Oswego which had apparently been bored by this insect, and in 1894 specimens were received at the experiment station of Ithaca from a great number of places, showing that it was present in alarming numbers. So far the insect has been recorded only from New York and Canada, but it will probably be heard from soon over a much wider range of country. Owing to its small size and peculiar habits the insect in any stage will be rarely noticed by a fruit-grower, and yet the second one of the curious suits or cases which the little caterpillar wears is conspicuous enough to reveal its presence to the casual observer. The first suit is manufactured in the fall, to be worn all winter, but about the 15th of May the half-grown caterpillar finds this too small, and proceeds to make a summer suit which resembles a miniature cigar in shape and color. These cigar-like objects can be seen moving over the leaf of a plant, although scarcely more than one-fifth of an inch in length, and when disturbed the little creatures retreat into them. The first indication of the insects' presence occurs on the swelling buds of Apple, Pear or Plum trees. Two or three have often been seen on a single bud busily at work eating holes into them no larger than a pin. The work on the expanded foliage is seen in skeletonized dead areas, which have near their centres a clean-cut round hole through one skin, usually on the under side of the leaf. The caterpillars also often attack the growing fruit. The bulletin gives the life history of this most interesting insect, from which it appears that it is only practicable to fight it while in the caterpillar stage, and then it is so well protected in its case as to render its destruction impossible unless the work is very thorough. It can probably be kept in check by two or three thorough sprayings with Paris green, if used at the rate of one pound to two hundred gallons of water. The first application, which may be effectively combined with the Bordeaux mixture for the Apple-scab fungus, should be made as soon as the little cases are seen on the opening buds. A second, and perhaps a third, application may be necessary at intervals of from four to seven days on badly infested trees. These sprayings will also check the bud-moth. It has been also found in Canada that a kerosene-emulsion spray applied at the same time as directed for Paris green is a still more effective check upon the case-bearer, and will probably be so on the bud-moth. In Pear-orchards this insect and the psylla can be checked by a spray of the same emulsion when the leaves are opening. It should be remembered that a fruit-tree ought never to be sprayed when in blossom, and that success in any case will depend almost entirely upon the thoroughness with which the work is done.

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLE:—Country Roads and Roadsides.	271
Notes on Mexican Travel.—X. (With figure.)	C. G. Pringle.
FOREIGN CORRESPONDENCE:—Noteworthy Orchids.	W. Watson.
PLANT NOTES.	273
CULTURAL DEPARTMENT:—Garden Work for Early July.	T. D. Hatfield.
Notes on Lilies.	F. H. Horsford.
Carnation Notes.	W. N. Craig.
Some Good Hardy Perennials.	R. Cameron.
CORRESPONDENCE:—The Future of the Long-leaf Pine Belt.	L. J. Vance.
Conifers in Iowa.	Professor L. H. Pammel.
RECENT PUBLICATIONS.	279
NOTES.	280
ILLUSTRATION:— <i>Lamourouxia Pringlei</i> , Fig. 39.	275

Country Roads and Roadsides.

PEOPLE who live in the country, and more especially people who pass their summers in the country, spend a very considerable portion of the time when they are not indoors in driving or walking over country roads. That the roadbed should offer good wheeling and footing, both for economy and comfort, every one admits, and when we remember how many people pass over a given stretch of road within a season, it needs no argument to show that if its borders are a delight to the eye, this fact will add greatly to the general enjoyment. Against the disfigurement of roadsides by linemen and path-masters, who turn them into raw or rocky wastes, or disfigure them with the axe and with fire, we have, therefore, often protested, and no apology is needed for recurring to the subject again.

Where roads are laid through smooth and highly cultivated farm-land, a broad border of turf extending on either side of the wheel track and flowing under open fences to unite with the grass of meadows or upland fields, with an occasional tree to break the monotony, is always agreeable to the eye when kept trim and neat. But where the features of the country are rugged and stony, undoubtedly the greatest beauty is secured if native shrubs and trees are allowed to take possession of the borders and the axe is withheld until they become too dense or aggressive. We have in mind a stretch of such road less than a mile in length to which we have alluded more than once, and we speak of it again simply to enumerate a few of its attractions at this particular season of the year. In the first place, it is not a highway of travel, and, therefore, it is only wide enough to allow two vehicles to pass. This is a distinct advantage. A broad road always has a depressing effect, and the wayfarer feels lonesome on it as he does on any other desert. The more nearly a rural road is obliterated by its surroundings the more delightful it is, and this is especially true of a by-road which offers a sense of seclusion as one of its principal charms. And, again, a narrow road can be more easily and cheaply kept in repair, since every additional square yard of surface requires so much more work, and this is an important matter in a community where the road-tax is a heavy item of expense. This par-

ticular road, after emerging from a piece of timber, climbs a hill and then winds about some others until it drops into the rich bottom-lands of a small river and joins an important highway. On either side of it trees and shrubs in great variety take care of themselves, and in the first week of July, when the foliage had been washed clean by the rains, this border in its general effect was singularly beautiful. In some places there were thickets higher than a carriage-top, through which the eye could hardly penetrate, while just beyond were openings to give glimpses of a picturesque, rolling country, with a mountain range for a sky-line. The masses of foliage projected and retreated in the most natural way, without a single hard line or discordant color, now shrinking into deep shadows and again boldly courting the full sunlight, so that to one looking forward the disappearance of the road to right or left always seemed an invitation to prospects still more fair.

The details of this border were quite as interesting as its general attractiveness. Here were Elders in the beauty of their bloom, and white Blackberry-blossoms close beside the red and black shining fruit of the Raspberries. Close along the roadbed the clustered flowers of Redroot were mingled with wild Roses, and here and there among these native wildings was an occasional Sweetbrier which had strayed from some old homestead. The buds of the smooth Sumach, in their tall panicles, were just yellowing into bloom, while the pink fruit of the Staghorn Sumach was already appearing. The Black Alders were showing inconspicuous flowers among the dark green foliage, and at one point where the ground was moist a mass of White Azaleas fairly glittered against the smooth clean leaves of the Spice-bush. Thorns and Cornels, Choke-cherries and Hazels and Huckleberries were in fruit, and the Hardhack was just opening its closely-set rosy flowers. Along with the shrubs were young trees of various species struggling to assert themselves. There were little Tulip-trees with foliage much larger than in mature specimens; Oaks and Maples of various species, with tints of foliage only seen in young individuals; Ash and Elm, and here and there a Hornbeam, one of which, thrusting out its horizontal branches above some low-growing Viburnums, was especially picturesque; Hickories, Butternuts, Chestnuts, Basswood and Sassafras; and over all these clambered the Wild Grape and Moon-seed, Smilax, Bittersweet and Clematis, with Virginia Creeper festooning the fence-rows or hanging from the limbs of the trees which had here and there been allowed to reach mature size.

Of course, at this season, the flowers were not so abundant either on the shrubs or beneath them as they were a month or so ago, but in the borders of the wood where the piece of road begins Prince's Pine and spotted Wintergreen were blooming, and the Wood Lily, *Lilium Philadelphicum*, was holding up its orange-red flowers. Virginia Anemones were not rare, and there was an occasional stalk of the graceful four-leaved Milkweed, while the great white feathery panicles of the tall Meadow Rue and the light pink bells of the Dogbane, which deserves a better name, were much more numerous. In one open place for a rod or more there was a brave show of Columbines of different colors which seemed as contented as wild ones among the grass, although they came from a pinch of seed scattered there a score of years ago. In another place, a depression by the side of the road showed where a house had once stood, although no man now living remembers it; and here, more evident than the excavation which was once a cellar, and is now nearly filled up by time, glowed a strong mass of the tawny orange flowers of the common Day Lily, *Hemerocallis fulva*, from roots which were probably set there in the last century.

The plants enumerated were only those which naturally arrest the eye at this season. Later on there will be other flowers and bright fruits, and then will follow the rich colors of the autumn foliage. But there is not a day in the year when one who walks or drives over this short bit of road cannot find delight for his eye and food for his

imagination. And why should not the roadsides of a civilized country be treated with as much regard to their beauty as public parks are? In one sense they are quite as truly a part of the general property of the people. This view of the case prevails in one of the hill towns in Connecticut, where an association of gentlemen has been organized especially to protect the roadsides. This is a matter worth the attention of every village improvement society, and where no such bodies exist much can be accomplished by personal argument and remonstrance, and if the subject is agitated on every occasion and discussed in the local papers a sentiment will be engendered which sooner or later will make itself felt. The people who destroy this beauty do not do it maliciously. They simply do not realize how much loveliness they are laying waste, and if their attention was called to it, and remonstrances made in every case where natural scenery is defaced, the evil would decrease. This has been demonstrated more than once.

One argument more potent with many men than all other considerations is this: Natural beauty has a distinct money value. As society becomes more enlightened this beauty will be valued more highly. It is a business truth, that the man who diminishes the beauty of his estate by carelessly chopping down trees or defacing its road borders at the same time lowers the market value of his own land and that of his neighbor's. It is also a truth demonstrated in practice, that the people of any town who make an intelligent effort to preserve and develop its natural resources in the way of scenery also make a distinct addition to the market value of every acre within its limits.

Notes of Mexican Travel.—X.

OAXACA.

IT was the remote state of Oaxaca, situated on the Pacific coast, and occupying the extreme southern portion of the Mexican Republic, which mainly engaged my attention on my tenth botanical journey to that country. Landing with my assistant from a steamship of the Ward line at Tampico on April 26th, 1894, I took a train of the Mexican Central Railway early the following morning for the capital city. The long winter drought was still unbroken, and the seventy miles of lowland plain first crossed were dusty and hot. In the sparse forest covering it most plants were dormant, only a few shrubs showing blooms. A welcome relief to this oppressive monotony, and all the more interesting and delightful by contrast with it, was our ascent of the successive benches of the verge of the table-land; the abrupt hills covered by strange growths, the beetling masses of lime-rock towering on the sides of the cañons threaded by us, the intervals occupied by open meadows, the feeding-grounds of deer, or tropical forests embellished by epiphytal plants in variety, the blue river winding through these, with its wonderful chain of cascades a mile in extent, white torrents pouring into deep blue pools, green-rimmed with moss-covered tufa; the Palm groves on either hand, the Coffee plantations in the dim mountain forests, the Cane-fields showing light green far down the valley, the bold climbing by our train of the mountain-side through untamable wilds, its alternate clinging to dizzy brink and rolling through tunnels cut in the solid rock; and, finally, the unmatched view down the far receding vista of the great cañon through which we had come up into the cooler air and broader light of the table-land. Many a time before had I passed through these scenes, but never had their charm been greater, and never had the exhilaration at gaining the highlands been fuller.

It is by the Mexican Railway that we choose to travel into the south-east from the city of Mexico. Over meadows covered with brownish Salt-grass we pass between lakes Texcoco and San Cristobal, which at this season show wide margins of bare earth whitened by alkali. We quit the Valley of Mexico for the Plains of Apam, which wear a

bluish green hue from their frequent plantations of Agave Americana, the source of pulque, the national beverage. All the way to Puebla we see much of the best soil, the extensive glades and hillsides of this open country devoted to this culture. At this season the landscape shows scarcely any other verdure. Not until July will rains refresh the parched earth and cover it with springing grass and abundant flowers.

Thus 116 miles to Puebla, a large and boastful city, situated in the midst of the almost unbroken plain lying between the snow-peaks of Popocatepetl and Orizaba. Here we pass the night to take train at six a. m. on the Mexican Southern Railway, leading from this point to Oaxaca, a distance, as the road runs, of 230 miles. When we have gained Tehuacan, seventy-five miles out from Puebla, we find ourselves on the border of the Plains of Puebla. To the east of Tehuacan rises a chain of mountains which connect Mount Orizaba with the mountains of Oaxaca, here visible in the south-east. As these mountains present a barrier to the rains which come up from the Gulf, the region of Tehuacan is comparatively arid, and from the scanty soil of its hills and mesas of lime-rock we see growing the vegetation peculiar to such conditions—Cactuses, Yuccas and stunted shrubs.

Such is the character of the country till we come to San Antonio, the first station within the state of Oaxaca. Here we enter a bewildering labyrinth of river cañons, narrow and heated gorges, often with picturesque walls of red conglomerate. On every hand arise high above us brown, arid steeps which bristle with tall Cactuses overtopping scantily leaved shrubs. Only along the water-course stand in a narrow line more verdant and umbrageous growths. For three or four hours our train is gliding along such cañons. Here and there they open out to give room for strips of arable intervalle with ranches or villages; in many places they are so narrow that their wall has been cut down or tunneled through to make place for the roadbed. We descend with the water to an elevation of only 1,800 feet above sea-level; then, leaving the main stream, we follow up one of its branches toward the continental divide. At an altitude of 3,000 feet the Cactuses disappear, and the hillsides are covered thinly with numerous species of subtropical shrubs and trees. Between 4,000 and 5,000 feet the forest-growth becomes heavier, and its composition is somewhat changed. A Palm and an arborescent Nolina, presumably *N. inermis*, Watson, here occur on dry limestone bluffs. The station of Las Sedas occupies the summit at an elevation of 6,000 feet. This is a gap in the water-shed, whose undulations of limestone formation are covered with a meagre forest of *Juniperus flaccida*, Schl., and various Oaks. To the west of this point, occupying the north-western corner of the state, lies the Mixteca Alta, a rugged region of 6,000 to 9,000 feet elevation. East by south trends the Andean system, here called the Sierra de Juarez of late (formerly the Sierra de Oaxaca), its highest peaks rising to 10,000 to 11,000 feet. Southward stretches the lovely Valley of Oaxaca, a hundred miles in length.

A run from Las Sedas of thirty miles and a descent of 1,000 feet brings us at nightfall to the city of Oaxaca, with its 40,000 inhabitants, situated beside the spreading sands of a river, and surrounded at all times of the year by fields of Maize and Sugar-cane. It was early May, when we settled in Oaxaca to work the surrounding country, and found in Rev. Lucius C. Smith an excellent friend and co-worker in botanical pursuits, and in his mission-house admirable quarters. But little rain had fallen; and, except in irrigated fields, the earth still showed brown. Luxuriantly green, however, were the heavily forested mountains surrounding the valley. North-east from the city, its crest only a dozen miles away, rises to over 10,000 feet a spur of the Sierra de Juarez, called the Sierra (or Cerro) de San Felipe, after the village at its foot. On the west side of the valley the Sierra de Clavellinas, twenty-five miles distant, has an altitude of 9,000 feet. Nearer, in the south-east, is the flank of another group of mountains, while within a

mile or two of the city, on the north and west, the valley is broken by hills, whose summits, notably that of Monte Alban, give evidence by terraced fields of ample breadth, by vast mounds, ramparts, etc., of immense toil by a prehistoric race. The state of Oaxaca is a mountainous one, with countless fertile valleys lying among its mountains, and all its cooler summits are well wooded. Various tribes of Indians possess the land and live in a thousand villages.

Traveling in this state we were on the track of Galeotti and Liebmann and other collectors of fifty or sixty years ago, since whose day the state seems hardly to have been visited by botanists, owing to the fact that, before the railroad came to its capital in 1893, it was only to be reached by long rides in the saddle over hard mountain trails. From May till January we traveled out from our base in all directions; and, wherever we went, we met with as many desirable plants as we could handle, the usual proportion of undescribed species among them, till we had secured a collection far greater than any previous one. The rainfall increased in amount throughout June and July, waned in September, and ceased altogether by the middle of October. The period of greatest heat preceded the rainy season, yet I cannot tell of oppressive heat at that elevation, though the region lies only seventeen degrees north of the equator. Seldom does the mercury rise above eighty-five degrees, Fahrenheit. Killing frosts formed in open places of the higher mountain tops about the end of October, though, under forest protection, several species of *Cnicus*, *Senecio*, *Eupatorium*, etc., bloomed throughout the winter. In the valley it was only in the lowest spots that crops were at any time in peril from cold.

Many times we went by train to the hills around Las Sedas for the plants which only grow in dry, calcareous soil, or to stations below in Tomellin Cañon, where were to be found the denizens of the hot lowlands. Among these, *Acacia Pringlei*, Rose, an upright tree of considerable size, was a new find. Twice, with Indians and donkeys conveying our supplies of food and paper for the trip, we tramped to the western mountains, where were springy alpine meadows, rich in novelties. On another occasion, alighting from the train at Las Sedas, alone and with our loads on our own backs, camping in the wilds where night overtook us, and gathering plants as we went, we marched some fifty miles, and during three days over the windy heights of the divide and down through long cañons to the river in the burning deserts, to regain the train at Tomellin. The bales of plants brought home on that trip included not a few new species.

A score of times we climbed to the summit of San Felipe, on which visits we scoured its crests for several miles, usually passing a night or two there under the scanty shelter of some tree, or, at best, of some coal burner's shed, formed of pine rifts and bark, or of a jutting rock, and were often the sport of mountain tempests. On the sides of this mountain, at an elevation of 1,000 feet above the valley of Oaxaca, or 6,000 over sea-level, begins a belt of dwarfish Oaks, *Quercus glabrescens*, Benth. From 7,000 to 8,000 feet, *Q. grisea*, Liebm., is the prevailing species, and above 8,000, quite to the summit ledges, *Q. nitens*, Mart. and Gal.,混生 with *Q. reticulata*, H. B. K.; but the latter is the larger and more abundant tree, and in deep, moist soil about the summits forms the heaviest of forests. On certain of the drier and warmer buttresses of the mountain side, about 8,500 feet altitude, stand groves of the undetermined Pine first reported from near Monterey; while above this, and especially on the rocky ridges of the top, abounds *Pinus Montezumæ*, Lamb., and often attains magnificent size. By springs and brooks, from 2,500 feet to the top, *Alnus acuminata*, H. B. K., and *Salix Bonplandii*, H. B. K., are commonly found in large specimens. And in such situations, *Sambucus Mexicana*, Prest., and *Buddleia Humboldtiana*, R. and S., grow to a diameter of two feet or more.

All through the summer the moist and fertile mountain heights, whether in sunny meadow or in woodland shade,

were bright with flowers—blooms as varied and strikingly beautiful as any garden or hothouse can show. There were scarlet *Rigidellas* and *Tigridias*, there were *Dahlias*, *Fuchsias* and *Begonias* in several species, scarlet, purple and blue *Salvias* in large variety, several flaming *Lamourouxias*, blue *Lupines*, and blue and crimson *Pentstemons* as tall as our heads; there was a yellow-rayed *Heliopsis* of largest size among many other herbs, shrubs and trees, with flowers representing every color, whose names would be unfamiliar to the gardener. Of these, perhaps, the two most worthy of cultivation are *Abelia floribunda*, Decaisne, and *Spigelia speciosa*, H. B. K. The former is a shrub four to six feet high, growing in masses and densely hung during many weeks with rosy flowers two inches long; the latter is a perennial herb topped with a pendent truss of long tubular flowers, which are crimson tipped with yellow. More striking than these, however, and of much horticultural interest, if its successful cultivation is possible, is a new find, *Lamourouxia Pringlei*, Rob. and Greenin (see figure on page 275 of this issue). It is a much-branched but erect shrub, three to five feet high, found growing on the rocky and wooded summit ridges of San Felipe, and seen covered during many weeks of autumn with gorgeous crimson bloom.

But how shall I describe the charm of the Oak forests during the serene and sunny days of late autumn, when the masses of Orchids, clinging to the bodies and branches of the trees, were in flower—*Laelias*, *Cattleyas*, *Epidendrums*, *Odontoglosses*—the finest species which Mexico yields?

Charlotte, Vt.

C. G. Pringle.

Foreign Correspondence.

Noteworthy Orchids.

GRAMMATOPHYLLUM RUMPHIANUM.—This is the correct name for the plant described last year by Herr Kranzlin as a new species under the name of *Grammatophyllum Guilelmi II.* (see *GARDEN AND FOREST*, 1894, page 104), from plants introduced by Messrs. F. Sander & Co. Two plants of it are now in flower at Kew, one of which, I know, came from Borneo. The larger specimen has pseudo-bulbs eight inches long by three wide, leaves fifteen inches long and three inches wide, and an erect scape five feet long bearing exactly fifty flowers and buds. The flowers have subequal sepals and petals, each one and a half inches long and three-quarters of an inch wide, colored bright green-yellow, with large irregular blotches of dark brown; lip three-lobed, the two side lobes folded over the column, the lateral keeled, hairy inside, dull white, with brown lines, and a yellow crest. In both plants the three lowest flowers on the spike have only four segments and a perfect column, but no labellum.

CIRRHOPTALUM ROBUSTUM.—I noted this remarkable plant last year (see *GARDEN AND FOREST*, page 113) when it was added to the Kew collection. It was named by Mr. Rolfe in 1893 from a plant flowered by Colonel Trevor Clarke. Messrs. J. Veitch & Sons exhibited a plant of it in flower a few days ago at the meeting of the Royal Horticultural Society, when it was awarded a first-class certificate. It is by far the largest of all *Cirrhoptalums*, both in leaves and flowers, the former being a foot long and four inches wide, the latter four inches from tip to tip of sepals, which are half an inch wide, yellow, tinged at the base with purple, the petals yellow and the lip dark purple. A figure prepared from Messrs. Veitch's plant is given in the last issue of *The Gardeners' Chronicle*. The leaves as there represented are about half the size of those of the Kew plant.

CYPripedium BELLATULUM ALBUM.—A plant of this rare variety was shown in flower at the last meeting of the Royal Horticultural Society, and was awarded a first-class certificate. It is an exceedingly beautiful form, the flowers being quite as large as the type and of the purest white, save a small yellow tip to the column. The leaves are also remarkable in being quite green, whereas in the type they are marbled and colored dark purple beneath. According

to a note in the *Orchid Review*, this plant was discovered by a Mr. R. Moore, of the Shan States, Burma, who claims to have been the discoverer of the beautiful Cypripedium Charlesworthii. There are several plants of the albino *C. bellatulum* in English collections, all from the same source as that shown by Sir F. Wigan, of Sheen. Mr. Moore says that *C. Charlesworthii* grows on limestone hills, the roots clinging to the rocks with extraordinary tenacity.

PHAJUS COOKSONI.—The medal offered by the Royal Horticultural Society for the best new hybrid Orchid was this year awarded to Mr. Norman Cookson for a Phajus under the above name, the result of a cross between *P. Humblotii* and *P. grandifolius*. It is a distinct and handsome Orchid, not, however, up to the standard of Mr. Cookson's grand hybrid of 1890, *P. Cooksoni*, raised from *P. tuberculosus* and *P. Wallichii*, and which is, perhaps, the finest hybrid Orchid yet raised. The new one has greenish yellow sepals and petals and a large open lip, colored rich red, with golden veins at the sides, the front rose-colored, with dark red spots, the margin being elegantly frilled. The plant shown bore a spike of five expanded flowers. The name is not well chosen, as it too closely resembles *P. Cooksoni* for practical purposes. Last year the medal was awarded to *P. Owenianus*, a hybrid between *P. Humblotii* and *P. Oweniae*, a variety of *P. bicolor*, and raised by Mr. Cookson.

HABENARIA RHODOCHEILA.—This is a near ally of *Habenaria pusilla* (*militaris*), from which it differs mainly in having green leaves and pale green sepals and petals, the lip only being attractive in its size, an inch in length, deeply lobed, and in its bright scarlet color. There are several pans of it now in flower at Kew, where I first saw this species ten years ago, when a few plants of it were received from Hong Kong and flowered in a warm greenhouse. A figure of it has lately been prepared for the *Botanical Magazine*. It is worth a place along with such Orchids as *H. pusilla*, with which it is grown at Kew, and which will soon be in flower, and *H. carnea*, the Malayan species, which is as ornamental in foliage as an *Anectochilus*, being deep olive-green, with numerous silvery spots. These three and the tall white-flowered *H. Susannae* are well represented at Kew this year.

RENANTHERA IMSHOOTIANA.—A plant of this was shown in flower a fortnight ago by Mr. E. H. Woodall, of Scarborough. It was introduced about 1890 by Messrs. F. Sander & Co. among an importation of *Ærides Godefroyæ*, and first flowered with Mr. Van Imschoot, of Ghent, in 1891, when it was described by Mr. Rolfe in the *Kew Bulletin*, p. 200. It is closely allied to *Renanthera coccinea*, the flowers being nearly as large and as brilliant in color, while in its habit of flowering when small (Mr. Woodall's flowering plant is only six inches high) it is superior to that species. The sepals are broad and colored blood-red, the petals being narrow and colored yellow, with red spots, while the lip is pale yellow, with a pair of red spots near the base. The spike is axillary, unbranched, and bears a dozen or more flowers.

CATTLEYA SUPERBA ALBA.—One of the most beautiful and distinct of tropical Cattleyas is the typical *C. superba*, from the northern states of South America, which has been known in cultivation here about fifty years. Hitherto it has shown little variation in the color or form of its flowers, with the exception of the white-flowered form. This was discovered in the neighborhood of Para by Mr. E. S. Rand, in 1890, when it was introduced into England and named by Mr. Rolfe. It was shown in flower a fortnight ago by Mr. T. Statter, of Manchester, and, of course, easily obtained a first-class certificate. The flowers are pure white, except for a stain of golden yellow toward the front of the lip. The only drawback *C. superba* has is in its behaving rather badly under cultivation for a Cattleya. It is, however, easy to get, being abundant in a wild state and a good traveler.

HYBRID DISAS.—Our houses are gay with the bright pink flowers of *Disa Kewensis*, *D. Langleyensis*, *D. Premier* and *D. Veitchii*, as well as of *D. racemosa* and *D. tripeta-*

loides, two of the three species from which the hybrids were obtained, the third being *D. grandiflora*. I have before observed that while the last named is a comparative failure at Kew, the hybrids are as easily grown as Geraniums, while they reproduce themselves from offsets as freely as Strawberries. All they require is a cool house or frame, pot or pan culture in a mixture of peat, sphagnum and sand, and plenty of water at all times. There are spikes on some of the plants bearing eighteen or twenty perfect flowers, and pans ten inches across contain a dozen plants, each bearing a spike of bloom. These Disas may be ranked with plants for the ordinary greenhouse.

CYCNOCHES EGERTONIANUM.—A plant of this species has lately produced both male and female flowers at Kew. Last year a pseudo-bulb on the only plant we then had developed a growth about half-way up, and this was removed with the upper half of the old pseudo-bulb attached. This offset plant flowered two months ago, producing the long, pendent, many-flowered raceme of purple and green male flowers peculiar to this species. And now the parent plant is in bloom, bearing a short raceme of three thick, fleshy female flowers, the segments lanceolate, one and a half inch long and half an inch wide, the lip fleshy, smooth, with the appearance of a large flat, broad bean. Had both plants been in flower at the same time the occurrence would have been interesting, as, so far as I know, no plant in cultivation has produced male and female spikes together. The question arises, did the removal of the offset from the old plant influence the sex of the former? No flowers could be more dissimilar than the male and female flowers of this Cycnoches.

London.

W. Watson.

Plant Notes.

DWARF RED PAVIA.—It does not appear to be generally known that there are several very dwarf varieties of the Red-flowering Buckeye, *Æsculus Pavia*, indigenous to the coast region of the southern states, and that some of these varieties are hardy here in the north. As raised from the seed they are somewhat variable in the size of foliage and growth of the plants, but in the main they retain their dwarf habit and bloom when two or three years old from the seed, and when not more than twelve to eighteen inches high. The flowers are produced in a long terminal spike; calyx tubular, and the petals bright red and showy. The plants bloom here the first of June. Mr. Andrew S. Fuller has been growing these Buckeyes on his grounds at Ridgewood, New Jersey, for a long time, and the plants of one variety have reached a height of four feet in about ten years, while others of the same age are scarcely three feet high.

ELÆAGNUS ARGENTEA.—A well-grown specimen of this shrub, when it reaches a height of from eight to ten feet and as great a breadth, is certainly one of the very best of the woody plants with light-colored foliage. Some of the Asiatic species, like *Elæagnus longipes*, which we have described and figured and which is useful for its fruit, and the smaller *E. umbellata*, have been in recent years quite generally grown, but the native plant has been comparatively neglected. The flowers are white without and yellow within, and are not strikingly beautiful, but they are delightfully fragrant, and its abundant fruit is considered edible by persons who have not a fastidious taste, but the silvery foliage of its wavy leaves and the fragrance of its abundant flowers make it an attractive garden plant to those who do not care for its mealy fruit.

LONICERA FLAVA.—This plant, which has been preserved in a few gardens since its original discovery nearly a hundred years ago, like *Gordonia Altamaha*, was a lost plant until a few years ago, when it was rediscovered by Mrs. J. G. Smyth on Paris Mountain, North Carolina, very near the point where John Frazer gathered its seed in 1810. This Honeysuckle, as well as *Lonicera Sullivantii*, were figured in the third volume of *GARDEN AND FOREST*, and we have already explained how *L. Sullivantii* is the plant which

has been generally cultivated under the name of *L. flava*. *L. Sullivantii* is common in our parks and in old gardens, and its thick foliage, with glaucous bloom and bright red fruit, which remains fresh on the vines later in the winter

orange-yellow flowers are borne in June, and they are slightly fragrant. The fruit is bright scarlet and ornamental; the leaves thin and only slightly glaucous. Both of these Honeysuckles are good hardy climbing plants. Six years



Fig. 39.—*Lamourouxia Pringlei*.—See page 272.

than that of any other climbing Honeysuckle, has made it well known. The leaves, however, are often disfigured late in the season by mildew. *L. flava* is much more rare, but it deserves to be better known. The bright

ago we called attention to the distinction between these plants and the superior beauty of the true and rare *Lonicera flava*. At that time we suggested that some enterprising nurseryman would do a good stroke of business

and render a public service by taking up this plant and making it abundant, and almost every year since then we have spoken of it; nevertheless, it remains a rare plant in American gardens.

NYMPHÆA LILIACEA AND *N. ROBINSONI*.—From Mr. J. Brydon, of Yarmouthport, Massachusetts, we have received two other flowers of the rare *Nymphæas* originated by Monsieur Marliac, and now first flowered in this country. These are of the same series as *N. Laydekeri*, *N. flammea* and *N. ignea*, previously described, and are the progeny of a cross between the *N. rubra* of the tropics and some hardy *Nymphæas* whose identity has not been disclosed. *N. liliacea* is about the size of *N. Laydekeri*, but with much wider and less-pointed petals. The sepals are dark green, with brownish shadings and margined with pale rose. The petals, eighteen in number in the specimen received, are suffused with magenta-red on a white ground on the outer row, and the inner petals are nearly self-colored of a darker shade. The stamens are closely clustered, deep orange, with yellow tips. The flower is particularly brilliant under artificial light. *N. Robinsoni* has long pointed sepals and petals. The former are pale olive-green, lined with primrose and rose. The petals are as numerous as in *N. liliacea*, and have a touch of yellow in their red, it being, we understand, one of the crosses with a yellow species. These are welcome additions to our hardy *Nymphæas*, and will be especially valuable if they possess the free-flowering habit of *N. Laydekeri* and can be propagated.

KNIPHOFIA PAUCIFLORA.—This Natal species is very distinct and quite unlike the usual "Poker-plants" in habit and flower. The leaves are narrower and slightly channeled. The small flowers are tubular, with spreading notched lobes, which are creamy white, the tubes being bright yellow. The flowers are borne sparsely on one side of a short erect stem.

SENECIO JAPONICUS.—Among hardy herbaceous plants of a bold character there are few more effective than this Groundsel. It has stems about five feet tall and palmate leaves deeply lobed. At this time its flowers, which are composite, are open. They are yellow, some three inches in diameter, with bold rays. It is for its foliage, however, that this plant is specially adapted, and in a rich moist soil it becomes highly ornamental. Though introduced to cultivation long since, it does not seem to be much known.

Cultural Department.

Garden Work for Early July.

SEED should be now sown for the earliest lot of Cinerarias. We usually sow it in a cool house, but cold frames answer the same purpose. The soil for the seed-pans should be light. A compost of half-sifted leaf-mold and loam, with a handful of sand, is most suitable. The seed is small, so that scarcely any covering will be required. If it is sown on a rather uneven surface, and the pan or box is given a shake afterward, it will be sufficiently covered. As frequent waterings, even with a fine sprayer, disturb the seed, we partly submerge the pans, wetting the soil on the subirrigation plan. For all fine seeds this is by far the better way. The seed should germinate in less than two weeks, and in the course of a month the seedlings should be ready for small pots. We shift by easy stages, using slightly heavier soil each time, making the final shift some time in October into seven or eight inch pots.

Our last lot of Gloxinias are now in bloom. Following our usual plan, we shall sow a box of seed this week, and the plants will make small bulbs before the winter. Started again next spring they will give us a lot of medium-sized plants, which we grow in six-inch pots to about a dozen blooms. For all purposes, except for exhibition, these are the most convenient size. We hold them another season, making our largest specimens in eight-inch pots, and many of them measure two feet across, with nearly a hundred open flowers at one time. We have selected our blooms for seed with care, so that now we have a strain of our own with flowers of moderate size and striking colors, on plants which are floriferous and of good habit.

Our Chinese Primulas have been shifted into four-inch pots, and by easy stages they will be put into six or seven inch pots

as their vigor demands. Slightly heavier soil may be used, although I have seen very fine *Primulas* grown in a soil composed almost wholly of leaf-mold. Cold frames with an easterly exposure are best suited for these plants, with slight shade and abundance of air day and night. When flowers appear on any plants, as will happen in September, they should be taken out as soon as the first flower opens, and all which show inferior color should be discarded. The sowing of herbaceous Calceolarias had better be deferred until the end of July.

Shrubby Begonias for winter blooming can be grown along in successive shifts. Generally seven-inch pots are large enough to conveniently handle when required for decorations. Nearly all Begonias naturally make good specimens; *B. incarnata*, however, is often disposed to bloom prematurely, and in this case we take out the tips and pick off the blooms, to encourage a better development of the plant for blooming later.

Small plants of *Cytisus racemosus* are better grown in pots. If planted out, it has been our experience that they grow too large and are difficult to lift. Small plants, neat in shape, about eighteen inches high and a foot through, are a very serviceable size, and in order to have plenty of these at hand we raise a new set every year. Young growths now breaking away from old plants which have been "cut in" and taken with a heel are more likely to root than cuttings of the ordinary kind.

Euphorbia fulgens, with long graceful stems clothed with bright orange-scarlet flowers, is a cheerful object in the greenhouse in winter when it is cut in long sprays and largely used for decorations. The plants are now making good growth, and later on will be benefited by weak applications of liquid-manure. A plan followed with this, as also with the showy *E. pulcherrima*, commonly called Pointsettia, is to plunge the plants for the summer in a spent hot-bed, and a luxuriant growth is usually made. Where bottom-heat is at command, some growers take off the tips of the Pointsettia, and rooting these late in the season they form low stocky plants, which in England are very largely used for church decorations. *Deutzias* in pots may have a little liquid-manure once a week. One lot struck this spring from soft wood were recently planted outdoors. They are not expected to flower this winter, but with another season's growth they will be neat plants, ready for six-inch pots. Those who wish to adopt this practice should now take soft cuttings from plants outdoors; they will root easily and will make good plants another season. Indian Azaleas which flowered early should now have made their growth. Those in pots would be benefited by a little fertilizer.

Cuttings of Zonal and fancy *Pelargoniums* for winter and spring flowering are better if rooted now. *Bouvardias*, *Stevias* and *Paris Daisies* should be regularly and closely pinched in, and Carnations also until the end of July, and even later, if not required to flower early. Pansy seed should be sown this month, and *Myosotis* for next spring's bedding. Canterbury Bells, Foxgloves and Sweet Williams, which are required for border work, should be transplanted into nursery beds. Foxgloves and Canterbury Bells we find of great service for piazza decoration, and always pot a number every autumn for this purpose, storing them in a cold frame. Brompton and Autumnal Stocks, as they bloom, may be marked and have the flower-stems cut away. These will make good plants later, and we shall be certain of knowing which are double and of good color. Plants of *Hydrangea Otaksa*, which have been used for spring decoration, can be cut into four eyes on the strongest shoots. These should break and make good shoots before the autumn. The value of this plan of restricting the growth will be found next spring, when fewer but larger heads of flowers on self-supporting stems will be the result. The common Snapdragons, as winter-blooming plants, have given so much satisfaction lately that all who have a few of the dwarfer kinds should take plants up this autumn. For winter blooming it is not yet too late to sow seed. Frequent applications of Bordeaux mixture may be applied to Violets as a preventive of disease. At least, mine escaped the sickness, and I attribute this to timely spraying.

Lately I made a nursery bed of young hardy plants raised from seed this spring, and shall go over the rock-garden and take out a large number of seedlings to hold as a reserve. In a large garden, where borders have to be continually replenished, the value of a reserve garden cannot be overestimated.

T. D. Hatfield.

Notes on Lilies.

THE flowering season for most hardy perennials has been a haphazard one this year. The late frosts seem to have changed things. No idea of the usual succession of flowers can be had from this year's experience. Many of the Lilies

which were the most advanced were cut off in the bud. They did not all die down, but no flowers will be produced on such as were sufficiently forward when the freezing weather came. *Lilium speciosum* and *L. Hansoni* have suffered, also *L. Dalmaticum*; *L. Henryi* was partly cut back, though a few plants will bloom.

Among the various Lilies that have already flowered here not one has given more satisfaction than the Nankeen Lily, *Lilium testaceum*, or, as it is often called, *L. excelsum*. The origin of this beautiful species is unknown. It is believed, however, to be a hybrid between *L. Chalcedonicum* and *L. candidum*. The plant attains a height of six feet in the most favored situations, but four feet is, I think, nearer its usual height. The three to ten nankeen-colored flowers are borne in umbels, coming out nearly at the same time, or sufficiently near to be all open at once and fresh. When cut they are the most durable of any species I have yet noted. The best results have been from fall planting. Out of a hundred planted last autumn only a few failed of blooming, while from a smaller lot set in the spring not one has bloomed, though most of these sent up stems.

Another pretty species in flower at the same time is the Orange Lily, *Lilium croceum*, a native of the south of Europe. This plant is one of the strong-growing species, pretty sure to succeed in any good garden-soil. It is about the size of *L. bulbiferum*, but is, it seems to me, a better species. *L. Parryi* blooms this year with these and the two forms of *L. concolor*. *L. Parryi* is not so easily grown, yet, if the right soil is at hand, it can be made a success. It needs more moisture than most Lilies, which can be supplied to a great extent by giving it a good mulch. It also likes a peaty soil. The canary-yellow flowers are fragrant and have a peculiar appearance on account of their sepals turning back more on one side than on the other. They are nearly horizontal to the stem. My best plant bore seven flowers. They are of much shorter duration than those of *L. testaceum*.

Lilium Columbianum was the first species to bloom, and had good-sized seed-capsules formed before *L. Hansoni* had opened. I am inclined to believe that this is the earliest species to bloom, though Mr. Elwes, in his monograph on Lilies, says of *L. Hansoni*, "It is the earliest in growth of any kind I know." I find, however, that bulbs of *L. Columbianum* from different collectors do not flower together.

F. H. Horsford.

Charlotte, Vt.

Carnation Notes.

CARNATION plants remaining under glass in beds or on benches now require copious supplies of water and frequent applications of stimulants. Our own plants are still flowering profusely, and the blooms are, as a rule, quite equal to those produced in the early spring months. To keep red spider in check we syringe the plants thoroughly morning, noon and night on bright days. A good wetting overhead at noon is especially beneficial on hot days, and we have failed to detect any injury to the flowers from this practice. As the flowering season is nearly ended, it is possible to pass judgment on the varieties cultivated. We have kept a record of flowers cut from most of the kinds grown. Of some sorts we had as few as half a dozen plants, and it is, of course, unfair to pass a conclusive opinion after the first season. We have, however, carefully noted the behavior of these same varieties in other places where Carnations are largely grown for market. Soil and locality have much to do with the success or failure of certain kinds, but unsuitable houses, erratic temperatures, careless ventilation and watering and a failure to comprehend the requirements of the plants are also causes of non-success.

William Scott has proved by far the most prolific pink variety, and nearly everywhere it is highly spoken of. At present it is yielding an abundance of fine flowers, produced on long stout stems. Nicholson is destined to become popular; its large size, delightful fragrance and beautiful color have caused it to be in large demand in the market. Although we have not had nearly so many flowers from it as from William Scott, the introducer, Mr. Nicholson, of Framingham, Massachusetts, who grows both kinds largely, has had more blooms from his namesake than from William Scott. The appearance of his plants certainly bears out this statement. The flowers of Nicholson have a tendency to come semi-double and occasionally single in summer. We find that this tendency is checked by disbudding. Madame Diaz Albertini has not proved a prolific bloomer by any means. While it has many good points to recommend it, there is no use for it where Scott and Nicholson succeed. The same is true of Ada Byron, which, while a prolific spring bloomer, with some

good qualities, is not a profitable kind to grow for market. Thomas Cartledge, which produces flowers of a bright carmine-pink color, is a variety well worth retaining. The flowers are of medium size, of pleasing color and borne on stout stems.

Lizzie McGowan, among white Carnations, has proved far and away the best variety. Mrs. Fisher produces too many burst flowers and the stems are weak; it cannot compete with Lizzie McGowan when the latter is well grown. Hector remains the best scarlet. By disbudding well down the stem fine flowers are produced, but it lacks a stout stem to hold the flower up like those of Portia. Portia is still worth retaining; except for its lack of size other scarlets would all be seconds to it. The Stuart has proved the least satisfactory scarlet we have tested. The flowers are sparingly produced, and they come streaky and often almost single. The stem is excellent. This kind is not useful in this section. Winter Cheer is a good variety to grow in pots. It is not a free bloomer when compared with Hector or Portia. Helen Keller has given us fewer flowers than any kind we have grown. Half the flowers fade before they are half open. Other near-by growers have found it a total failure; we hope next year to have better results under different treatment. During early winter Bouton d'Or proved the best yellow. Goldfinch has, however, produced twice as many flowers during the whole season; this variety has a long stout stem, and the flower is certainly a much more decided yellow than those of Bouton d'Or. Its tendency to burst the calyx is its chief drawback. Daybreak, in its special color, continues satisfactory; its delicate salmon-pink color keeps it a prime favorite, and it is one of the most floriferous kinds grown.

Summer-blooming plants in the open are now commencing to flower and will need to be staked and kept tied up if clean flowers are desired. Carnation-flowers grown out-of-doors are never so clean as those grown under glass. Dust, smoke and splashings from heavy rains all help to discolor them, and it is well to dip the flowers in clean water a few times after gathering them to remove the traces of dirt. Mrs. Fisher, the best outdoor bloomer, has a rather drooping tendency and needs more frequent tying up than other sorts. The heavy rains at the end of June, after a month of drought, have started plants into good growth. Those being grown for next winter's crop now require looking over weekly, and all shoots should be stopped before they have run up too far. The tips should be drawn out with the fingers and thumb of the right hand, the left hand steadyng the shoot. Nothing but injury to the plants results from allowing them to grow up until they can be tipped with a pair of shears, as we have seen done. The surface soil will require frequent stirring with the hoe, and a sprinkler used in dry weather. We find that large plants produce more flowers than small ones, and they are of finer quality.

In the pressure of other work in spring-time the preparation of the compost-heap is often neglected. We always stack up the turf for this in the fall. The turf should be chopped and mixed with manure in April, and the heap turned over twice before being wheeled into the benches. We use one-third good cow-manure to two-thirds rather light sandy loam, and work in a little bone-dust in addition. Carnations require more feeding than they usually get, and if given a generous compost which has been thoroughly incorporated and treated rationally in other respects fewer starveling blooms would be seen.

Taunton, Mass.

W. N. Craig.

Some Good Hardy Perennials.

Clematis recta.—This is the best herbaceous Clematis, and there are few white-flowered hardy plants that equal it when in bloom. It is a many-stemmed plant of compact habit with abundant dark green, healthy leaves. The first year after transplanting it only grows about three feet high, but when it gets well established it reaches a height of four or five feet. The flowers, which are plentifully borne in dense corymbs at the ends of the stems, are white and fragrant, and last well when cut. It would seem that a plant so easily grown and with such good flowers might be of great use to florists. *C. recta* makes an effective plant in the herbaceous border, but it grows well in almost any position. There are plants here under Oak-trees, where they get very little sun, and they are as healthy as those which stand in full sunshine, and their flowers last even longer. This Clematis comes from the south of Europe, and was introduced from there in 1597. It can easily be increased by dividing the plants and also by seeds, although they are slow to germinate.

Thermopsis Caroliniana.—This native Pea-flowered plant

makes an excellent subject for the rear line of the herbaceous border. Its unbranched stems grow from four to five feet high, and are well covered with dark green ternate leaves. The showy yellow flowers are in long terminal spikes, and they last for two or three weeks in bloom. It likes a good deep rich soil and a position where it is not shaded. When the plants are about three feet high it is beneficial to them to be tied loosely to a stake, for if the large spikes are wet with rain they are apt to fall down, and are not so handsome afterward. This plant can be increased in spring or fall by dividing the old roots, or it can be raised from seed. It produces an abundance of seeds annually, but they are slow to germinate and should be sown soon after they are collected. The plant grows wild in great abundance among the mountains of North Carolina.

Oenothera Missouriensis.—This Evening Primrose attracts more attention in the evening now than any plant in the mixed border, where it occupies the front row. We have some twenty plants, and each one measures a yard in diameter, and the large yellow flowers are admired by every one who sees them. *Oenothera Missouriensis* is a prostrate plant with numerous stems a foot or more long, and lanceolate leaves. It is well adapted in habit to the rock-garden, where its stems can hang over stones or rocks and show to advantage its large yellow flowers. The flowers are borne in the axils of the leaves, and they are very large, measuring over four inches in diameter, and the calyx is five inches long. Seeds are produced here, and from them young plants are conveniently raised, or from cuttings taken in May. Old-established plants should not be disturbed often, or when they have to be transplanted they should be taken up with a good ball of soil, so that the roots will be broken as little as possible.

Acanthus longifolius.—We have always given this plant the shelter of a cold frame during the winter, supposing that it would not be hardy here. A year ago, however, we had some strong plants set out in the border. They made vigorous growth during the summer and fall, and when frost set in they were covered with a good coating of Oak-leaves. To our surprise every plant lived through the winter and is flowering freely now. This large-leaved, stately plant, with its curious spikes of flowers, is very attractive. It grows three feet high, with radical leaves four feet long. The sessile purple-rose flowers, which are in the axils of the oval spiny bracts, are produced in long crowded spikes. If this plant has a good, light rich soil and a position where it will not be shaded in any way, and covered over in winter with leaves, I think it can be trusted as safely hardy. It is a native of Dalmatia and was introduced in 1869. *Acanthus mollis latifolius* has also stood the winter with the same care as the above species. It is just beginning to push up its flower-spikes. We have some plants of both the above species grown in a cold frame in a shady position. Although they are much larger than those in the border, they have not begun to bloom yet. This shows that it is essential for their welfare to be planted where they can get plenty of light. They are increased by division of the roots in spring or by seeds.

Lythrum Salicaria.—Near the margin of a small pond many strong plants of this Loosestrife are carrying large showy spikes of flowers. It is a British plant, although it is naturalized here, and is not rare in moist grounds, and it is an excellent subject for planting near the margins of lakes and streams. It grows about five feet high in good soil, and has large handsome spikes of rose-colored flowers.

Harvard Botanic Garden.

R. Cameron.

Correspondence.

The Future of the Long-leaf Pine Belt.

To the Editor of GARDEN AND FOREST:

Sir,—A few weeks ago when I was in the Pine district of the south every evening the sky was illuminated by a dull red glare, and in the daytime the horizon was obscured by a thin veil of smoky haze. The cause of this was the turpentine industry, which has now reached its busiest season.

Few people who have not been in what is called "the Long-leaf Pine belt" of the south can have any real idea of the extent of the damage done to the country by the turpentine workers and by the lumbermen, both of whom conduct their business on what has been bluntly called "the robbing system." They have left immense areas of land robbed not only of its natural resources, but in a worse condition for clearing and culture than before their invasion. Such is, without doubt, the case of many square miles in the two Carolinas, in Georgia, in Alabama and in Louisiana.

The result is that the most bare and barren places in all the south are those that have been visited by the army of turpentine gatherers. Every northern visitor familiar with well-ordered and cultivated farm lands and houses is struck by the great tracts of southern country on which there is no vegetation of any value. These wastes are deserted and uninhabited, except here and there by the negro's lonely cabin.

The loss from fires is enormous. The turpentine workers are so careless and indifferent as to allow fires to run through the tracts in which they have worked. The resin on the scarified surface of the trees burns like kerosene; a spark, a blaze, and all at once a disastrous conflagration is sweeping through the Pine-forests with great fury, destroying millions of feet of marketable timber, and leaving hundreds of acres a scene of awful ruin.

This is no highly colored story, but a plain statement of what has been going on in the Pine belt for years. Now and then protests have been raised against the reckless manner in which these forests are being destroyed, and yet very little has been done either by private or by public action to protect one of the greatest resources of the southern states.

This is the more remarkable when we consider the enormous wealth represented by the Long-leaf Pine belt. There is a strip of Pine-forest about one hundred miles wide that begins in North Carolina and follows the Atlantic and Gulf coast plain to Texas, crossing six states and covering an area of about 130,000 square miles. At a rough estimate, there may be 50,000,000,000 feet standing in this area; and if we take the values of timber and turpentine, the annual product of the forests of the south will approach in value the product of her Cotton-fields.

The pineries of the south now yield naval stores worth nearly \$10,000,000 a year. The total production amounts to 340,000 casks of spirits of turpentine and 1,490,000 barrels of resin. In order to produce this enormous yield some 2,500,000 acres of Pine-forest are being worked, and nearly one million acres of virgin forest are invaded annually. Now, no one will claim that these pineries are inexhaustible, for there has actually been a decline in the production of naval stores within the past eight or ten years. The reckless cutting and tapping of trees have made great inroads into the magnificent stretch of Pine. Railroads have opened up many new tracts of timber, the old water mills have been replaced by steam saw-mills, and when the supply in the neighborhood was exhausted tramroads have been built or the steam mills taken to new territory. Thus, the work of consumption and denudation has been carried on to such an extent that fears are just now beginning to be entertained that these invaluable forests will be sacrificed to the greed for immediate and temporary gain.

The truth is, the Long-leaf Pine belt is the backbone of the south Atlantic states. For a hundred and fifty years it has been the chief resource of the people who dwell in the belt. The production of pitch and tar was begun in North Carolina during colonial days, and as the state took the lead in the industry its people were called "tar heels." There has been a heavy decline in the production of naval stores in North Carolina. This decline, amounting to fully forty per cent, is due simply to the exhaustion of the Pine-forests. Of course, much has been written on the destructive agency of the turpentine industry, and many suggestions have been made regarding changes and improvements which are necessary. It is agreed that the turpentine industry, as carried on in the United States, results in great loss and damage, directly and indirectly. Compared with the way in which the French gather turpentine, our methods seem crude, wasteful and almost irrational.

The American turpentine workers still continue to follow the old-time methods of tapping the trees for their sap. They have made few changes or have adopted few improvements. They cut a deep, broad "box" at the base of the tree, and then the surface above the box is laid bare. The trees are worked for four or five seasons, when they become practically exhausted of their sap. The forest is then abandoned to the elements, to the bark-beetles and pine-borers, and finally the splendid trees are blown, burned or cut down. The French turpentine worker cuts no deep box into the tree, but uses a pail, into which the resin or crude turpentine is conducted by a gutter. He makes only a small chip about three or four inches wide, and this is enlarged from time to time. After five seasons' working the trees are given a rest of several years, and so, by alternating periods of tapping and of rest, a tree can be profitably worked for fully fifty years. The French also take measures to regenerate their Pine-forests and to keep the trees strong and uniform.

If our turpentine workers understood the first principles of forestry they would modify their destructive methods. With

more knowledge based on experience the day will come when the southern people will see that good husbandry consists in management, not destruction, of their forest resources; that some precautions and some protection are necessary against fire as well as individual greed; that the present policy of the turpentine workers is lamentably wasteful and short-sighted; in other words, that it is more profitable to work the Pine-forests for fifty years instead of five years; and, finally, that the lumber and turpentine industries, while changing the face of nature and even the climate of the country, are slowly, but surely, making loss and trouble for this and succeeding generations.

New York.

L. J. Vance.

Conifers in Iowa.

To the Editor of GARDEN AND FOREST:

Sir,—One of the most interesting features of the Iowa flora is the commingling of northern and southern forms. Sargent has called attention to the occurrence of several of the southern trees occurring in Iowa as *Quercus Texana*. We have also *Hicoria laciniosa*, *H. glabra*, *Æsculus glabra*, *Cercis Canadensis*, etc. The northern conifers are but sparingly distributed in Iowa, and definite localities are wanting. The distribution of some of these is so local and interesting that I record the localities. White Pine, *Pinus Strobus*, Sargent,* records "near Davenport" (Parry). Gray† also gives the same locality, while the later edition gives the general distribution of eastern Iowa.‡ As the species has been reported to me from several points, these should go on record. The species is quite local; the sandy ledges or limestone rocks along river courses are the only situations where it occurs in Iowa. Davenport (Parry), Muscatine (Reppert and Calvin), Cleremont and Elgin, in Fayette County (Pammel), near Decorah, Winnesiek County (Pammel, Holway), along the Wapsipinicon, in Buchanan County (Calvin), Delaware County, not far from Manchester (Calvin), Allamakee County (Calvin), Clayton (Pammel), Guttenberg (Pammel). The most westerly locality in Iowa known to me is in Hardin County at Steamboat Rock. This is a little north and east of central Iowa. A dozen or more good-sized trees occur on the rocky ledge of the Iowa River. Other localities probably occur along the Iowa River. This locality is, at least, 200 miles further west than those of eastern Iowa. The species may have been more common once than now, but it is hardly probable that the species was scattered by east winds, although it has excellent means of dissemination. Nor is it likely to have been scattered by the wind from the far north, as there are none for a good many miles. It is said to occur in Mitchell County, which is in the north tier of counties, but a little east of Hardin County.

I was much interested in learning about the occurrence of the Balsam Fir, *Abies balsamea*, in Iowa. I had been informed by several horticulturists of its occurrence in northeastern Iowa, especially in Allamakee and Clayton counties. I had considerable doubt about its occurrence, as I had searched south-eastern Minnesota and western Wisconsin, in the vicinity of Lacrosse, for the species, but so far I have failed to find it, although it occurs at Spring Valley, in Fillmore County, according to Winchell.‡ I spent a few pleasant hours with M. E. W. D. Holway, of Decorah, and found that he had a specimen in his herbarium collected near Decorah in 1878. The specimen was from a single tree which occurred on a steep bluff. I also learn from Professor Calvin that a considerable number of trees occur along the Yellow River two or three miles below Myron. The hill faces the north, and the trees occur for one mile along the river. The Clayton County localities given to me by Mr. Wragg are therefore confirmed. The topography of the county is rough, and numerous springs and streams occur. The Red Cedar, *Juniperus Virginiana*, is widely distributed throughout the state, occurring on the rocky bluffs along our rivers and streams, as at Boone, Ames, Des Moines and west. *J. communis* occurs quite frequently on bluffs in north-eastern Iowa.

Another conifer of north-eastern Iowa is the Canadian Yew, *Taxus Canadensis*. The species delights in sandy ledges in moist situations, occurring along with the Mountain Maple, *Acer spicatum*. The only other conifer to be looked for in Iowa is the Tamarack, *Larix Americana*. A small grove occurs in Houston County, Minnesota, just across the border, but none, so far as I know, has been reported from Iowa.

Ames, Iowa.

L. M. Pammel.

* *Forest Trees of North America*, p. 187.

† *Manual*, fifth edition, p. 470.

‡ *Watson & Coulter, Gray's Manual*, sixth edition, p. 490.

§ *Upham Catalogue of the Flora of Minnesota*, p. 133.

Recent Publications.

The Wonderful Wapentake. By J. S. Fletcher. John Lane, London. A. C. McClurg & Co., Chicago.

Wapentake is an old English term still in use in Yorkshire to designate the political division of land which, in other counties, is called a district or hundred. The author tells us, in a short but characteristic preface, that these sketches of rural life and manners were contributed from time to time to various English papers under the pseudonym of "A Son of the Soil." And as we read these simple records of the homely rural life of Yorkshire, we cannot but note that the pseudonym was wisely chosen, for the book smacks of the soil. In a wholesome sense it is of the earth, earthy, and breathes from every page an atmosphere as fresh and invigorating as the smell of the warm earth during a summer shower.

Mr. Fletcher has the sane and vigorous love of country and the familiarity with all phases of country life which, according to the generally accepted idea, characterizes the Englishman in all grades of society; and it is this complex English sentiment, this commingling of an instinctive love of natural beauty with the passion of the past, which is reflected in this pleasant volume. In some of the papers, as "An Old-fashioned Christmas" and "Village Feasts," Mr. Fletcher describes, with both humor and pathos, old Yorkshire customs now fast falling into disrepute. In others, as in "Going into the House" and "A Waif of the Highway," he give us character-sketches, very delightful through their almost homely simplicity. In these and similar sketches, the many apparently careless, yet always accurate, descriptions of rural landscape are instinctively subordinated to the human interest, and thus the English rustic laborer, farmer, carrier and woodman, stands before us, each in his habit as he lives; each so absolutely at one with his environment, that even those who have never set foot on English soil cannot for a moment doubt the truth of the portrait. In papers like "An October Walk," "A Rainy Day in Arcadia" or "The Last Day of Harvest," Mr. Fletcher has given us literal descriptions of scenes so common in all rustic life that it would seem impossible that anything of interest could at this late day be written upon such threadbare topics.

But the author's idealism is that of the lover rather than that of the artist, and in his eyes there can be nothing common or prosaic in "The Wonderful Wapentake of Osgoldcross," which was the home of his boyhood. The distant hills, vaguely outlined against the reposeful sky, are still the Delectable Mountains of his childish imagination; the sun that shines upon those happy valleys has never faded into the light of common day, and the silver streams that wind through the meadow grass still spring from wells of living water. The glamour is not lifted even from the country roads which bind town and village. The village with the distant hamlet, in his eyes, is lovely as of yore, and the pictures which he gives us of the familiar and beloved scenes are photographs idealized; that is, they combine photographic truth and fidelity to detail with the atmosphere of poetry. The eighteen fine illustrations which accompany the text would seem to indicate that the author has not too highly praised the beauty of his native shire.

Notes.

The Southern Florist for July is devoted almost entirely to Cactuses, and the interesting illustrations and abundant descriptions and cultural notes make it a very useful number for all those who are devoted to the cultivation of this kind of plant.

Only a few of the late varieties of vegetables are now coming from the south, owing to the cheapness and abundance of local products. Tomatoes are being forwarded from Norfolk and south Jersey, and green corn is coming from the same sections. Asparagus of fair quality may yet be had, and costs twenty-five cents a bunch.

The fragrant, clear yellow flowers of the Sweet Sultan, Cen-

taurea Moschata, are among the most beautiful of those now sold on the sidewalk-stands. This is a common market flower in Europe, but has never been offered so abundantly in this city as it is this season. It is one of those excellent old annuals which deserve to be taken into favor everywhere.

Some of the Kœlreuteria-trees in the parks of this city are just opening their flowers, while others have been in full bloom for nearly a fortnight. The difference in the time of flowering is very marked in this tree, and it would be interesting to know if seedlings from the same tree varied widely in this respect. If they do not, the difference may be due to the fact that the original seed came from trees growing in different latitudes.

The latest number of the *London Garden*, which has come to hand, gives the picture of an arrangement in a vase of flowers of Gaillardia and Gypsophila paniculata which is very pleasing. We have often advised the use of this Gypsophila, with its loose panicles of minute white flowers among larger and brighter-colored ones. It has a mist-like hazy effect which adds very much to the lightness and grace of the combination. Statice latifolia is another plant of great value for the same purpose, and so is Galium aristatum. All three are perfectly hardy perennials which will live on from year to year with little care. The neat little annual, Gypsophila muralis, is also very useful in the same way, and nothing is better to associate with Sweet Peas.

Mr. J. S. Woodward writes to *The Rural New Yorker* that persons who pasture sheep in their orchards do not, as a rule, use enough sheep to do the most good. The sheep can add nothing to the land but what they take from it, but if a large number, say fifty, are put in eight acres of trees seeded with Orchard Grass, and are fed a little bran, say about a pound a day to each sheep, something like a hundred and thirty-four pounds of nitrogen, a hundred and sixty-four pounds of phosphoric acid and eighty-six pounds of potash would be distributed during the season over the ground in the best possible way, while the sheep would keep down every weed and sprout, gnaw the grass close and eat every fallen apple as soon as it strikes the ground.

Delaware grapes are offered on the fruit-stands, with Niagara, and cost sixty cents for a three-pound basket. New California figs bring sixty cents a dozen. Royal Anne cherries of immense size and showy color command twenty-five cents a pound. Some Hale's Early peaches are already coming from Delaware. The main crop of Georgia peaches, being mostly of the early sorts, is practically exhausted. Those from California are now bringing good prices, which will probably be sustained until Delaware and New Jersey fruit is plentiful, when even the singular beauty of the California peaches will not avail in competition with the eastern fruit. About twenty-five car-loads of California fruit were sold here last week, including some seedling oranges. These brought the high average price of \$3.27 for a car-load, owing to the inferior quality of the Rodi and Sorrento oranges, which were damaged by frosts.

Nearly fifty years ago a Michigan nurseryman propagated Rosa setigera, our beautiful native climbing Rose, in considerable quantity, and sold it as a novelty to eastern planters. Few people, however, cared for single Roses then, and it never became common in our gardens. In the first volume of *GARDEN AND FOREST* we called attention to the singular beauty of its broad healthy leaves and its corymbs of large deep rose-colored flowers, which are certainly more effective than any of the double varieties which have sprung from the plant. Even after we had dwelt upon its value for several years correspondents would write to inquire where plants could be had, and only a few nurserymen kept it. We are glad to say that it is now offered by almost every first-class nursery establishment in the country, and it should find a place in every garden. It is just passing out of bloom here, where it has been flowering for a fortnight. The flowers last a long time when cut—that is, if the branches are cut just as the first flowers on the cluster are appearing, the buds will follow each other for a week or more until all have opened.

A bulletin from the Cornell Experiment Station, prepared by Professor George F. Atkinson, gives a very complete account of several of the fungi which cause the disease known as damping off, on account of which the tissues of the seedling plants rot at the surface of the ground. The life history of several of these fungi is given very completely. Of special interest is the fungus which is parasitic upon Fern prothallia in forcing-houses and which is new to America. An entirely

new species is also described. Since too much moisture in the soil, high temperature, insufficient light and close apartments favor the growth of these parasites, and at the same time weaken the growth of the seedlings so that they are less able to resist disease, the plain conclusion is that houses should be well lighted, supplied with fresh air and kept at as even a temperature as possible, and saturation of the soil should be avoided; if the disease once sets in the temperature should be kept as low as the plants will bear, and if they do not recover the soil in which they have grown should be discarded and the benches whitewashed; only perfectly healthy plants should be reset. Soil in which diseased plants have grown should not be used again until it is sterilized by steam heat for several hours.

We have more than once called attention to the value of the second crop of Irish Potatoes, raised in some parts of the south for seed. From the crop of early potatoes which is fit for market in June medium-sized potatoes are selected, spread out in the shade and exposed to the air for a week, when they turn green. After this they are covered with a thin layer of leaf-mold or straw, which is kept slightly damp, and in ten days or a fortnight they begin to sprout, when they should be planted. In the latitude of Carolina the tubers are fit to dig and store when frost kills the vine, and it is said that potatoes grown in this way and used as seed will produce a heavier crop of early potatoes in the north than can be grown from seed raised here. The great value of this seed is that it does not sprout in the spring, and even in the south it will not commence to sprout before June. *The Southern Planter* says that this seed planted in the south in June or early July will produce a late crop for table use which keeps longer and sounder than northern-grown potatoes. We are not sure that the quality of this crop will be as good as that grown in Maine, for example, or in Saratoga County in this state; but when we remember that last year we imported more than two millions of bushels of potatoes in excess of what was exported from the country, it would seem that it might be a profitable investment to grow this late crop on a larger scale.

Daniel Cady Eaton, the recognized authority in this country on Ferns, Mosses and Algæ, and professor of botany in Yale College, died in New Haven on the 29th of June, in the sixty-first year of his age. His grandfather, Professor Amos Eaton, was one of the leading systematic botanists of his day, and conspicuous among the comparatively few investigators in this field who devoted themselves during the early years of the century to the classification of the flora of the United States. His father, General Amos B. Eaton, like other members of the family, was given to scientific research, so that Professor Eaton inherited the passion and aptitude which gave direction to his youthful studies, and while yet in college he was the author of a paper on "Three new Ferns in California and Oregon." After his graduation from Yale College in 1857 he studied with Dr. Gray in Harvard for three years, when he enlisted as a private in the Seventh New York Regiment. After the civil war he was elected to the chair of botany in Yale College, which he held for more than thirty years and until the time of his death. He prepared the account of Ferns and their allied families for Chapman's *Flora of the Southern United States*; did the same work for the fifth edition of Gray's *Manual of Botany of the Northern United States*, and for Gray's *Botany of Field, Forest and Garden*. He wrote many papers on various botanical subjects, chiefly in his special field, and had charge of the botany in Webster's *International Dictionary*. His great work, however, was the well-known *Ferns, including the Ophioglossaceæ of the United States of America and British North American Possessions*, which was published in 1879-80, and illustrated with beautifully colored plates from drawings by J. H. Emerton and C. E. Faxon. Professor Eaton was an enthusiast in the special branch of botanical science to which he devoted his life, and he had the patience and the acuteness of discrimination necessary to secure for him his rank as an authority on flowerless plants. Many special students came to him for instruction, and his large private herbarium was one of the best of its kind in the world. Apart from his scientific studies, Professor Eaton was specially fond of genealogy and art, and took an active interest in public affairs. He had a singularly gentle and winning manner and a wholesome love of the woods and fields and outdoor sports. His achievements in science won the respect of the world, and among those who knew him more intimately in all his social relations he was held in esteem and affection for his kindness, sincerity and unselfishness.

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLES:—Old-fashioned Gardens	281
A Northern Forest. (With figure.)	282
The June Flora of a Long Island Swamp	Anna Murray Vail. 282
FOREIGN CORRESPONDENCE:—London Letter	W. Watson. 284
PLANT NOTES	284
CULTURAL DEPARTMENT:—American Irises	J. N. Gerard. 285
Midsummer Care of Chrysanthemums	T. D. Innes. 287
Some Showy Perennials	R. Cameron. 287
Three Good Plants	T. O. Cope. 287
Strawberries	F. P. P. 287
CORRESPONDENCE:—Stones as a Source of Fertility	T. H. Hoskins, M.D. 288
RECENT PUBLICATIONS	289
NOTES	290
ILLUSTRATION:—Forests on the Thompson River, British Columbia, Fig. 40	285

Old-fashioned Gardens.

MOST things move in cycles, and contemporaneously with the reappearance of our grandmothers' sleeves and petticoats the taste for old-fashioned gardens is revived. There is a fresh call for the perennials and annuals which enlivened the borders of long ago, and those who are fortunate enough to still possess one of these old-time gardens show with pride the long-treasured plants which have bloomed for so many years. We are apt to think that we know a good deal more about flowers than our progenitors, but the fact is there was, perhaps, more variety than there is to-day in many of their collections. Much time is given now to the development of perfect specimens and to the cultivation of new varieties, both in greenhouse and garden; but if we were to look over some of the venerable catalogues we should find that if we planted all that our grandsires did we should have our hands and gardens full, without anything new.

McMahon's *American Gardeners' Almanac*, published in 1806, gives a list of four hundred hardy perennials and biennials for the garden, with a hundred and twenty hardy annuals, including climbers, and among these we find many plants which are supposed to be comparatively new. Those early settlers in America who were well to do devoted much care to their gardens, and in the formal fashion of the day laid out their geometrical walks and box-bordered beds and filled them with all sorts of sweet-smelling or showy posies which are forever associated in our minds with our grandmothers who loved them. The early colonists found new and wonderful flowers blossoming in the woods and fields of the new country and transplanted them into their borders, and sent specimens of them to their old home, receiving in return slips and seeds of the dear old shrubs and plants which were full of association to their homesick hearts. The interest on this side of the Atlantic kept pace with that in Europe, and only twenty years after the founding of the London Horticultural Society the little town of Boston in 1828 organized its own and showed a laudable interest in bringing up the floricultural standard.

In those early gardens all sorts of bulbous plants were

grown, the passion for Tulips, which was at its height in Europe about the beginning of the eighteenth century, having lasted longer in the colonies; and the records show that Hyacinths and other early-blooming flowers were raised in great perfection and profusion.

Geraniums, Paeonies, Pansies, Pinks, Balsams, Four-o'clocks and Dahlias made their appearance in the borders in brave show. Columbines of various colors nodded everywhere. Lilies and Roses, then as now, were the joy of the gardener, and the trade-list of Parsons & Co., Flushing, Long Island, as early as 1830, contained over seven hundred kinds of Roses, while already two thousand different varieties had been named, though hybridization was then in its infancy. The China Aster and the Chrysanthemum were comparatively new and small, for the China Aster only began to reach England in 1730, and the improved sorts are of much later date, while the Chrysanthemum was but a sturdy little ball in the beginning of the nineteenth century, and was alluded to as "a neglected flower" as late as 1842. Carnations in many varieties, plain and striped, perfumed the air. There were the Flakes with stripes of two colors going the whole length of the petals. There were freckled and spotted ones, and Painted Ladies, with a white underpart to the petal, while the upper surface was red or purple, as if laid on with a brush. These latter have now so disappeared that few growers know they ever existed. Even the spotted ones have their colors now confined to the outer edge of the petals, and the freckles have gone out of fashion. Who does not remember the Clove Pinks which were such universal favorites, endless in variety, fragrant and fringed, and the little Maiden's Pink, which came so early, and the Chinese Pinks, with their deeply toothed petals?

There were Larkspurs, which sprang up everywhere, in all sorts of colors, from palest blue to indigo, from pure white to deep pink, with flowers poised like bees upon their stems, and stately stalks which lifted them high in air. There were masses of fragrant Stocks and rows of Balsams, whose impatient seeds flew at a touch, and bunches of the Sweet William, which seems now the most old-fashioned of flowers, and the Scarlet Lychnis, its appropriate neighbor, with stiff tall stem and red head aflame. We called it London Pride, but in England that name is given to *Saxifraga umbrosa*.

In June the beds were all ablaze with bouncing Paeonies, shading from white to deepest crimson, and later came the French Marigolds, in all shades of gold. There were Canterbury Bells, white and blue, and tall white Tuberoses of sickly sweetness, and Phloxes, white and pink, and big double Buttercups as large as little Roses, and the many-colored Marvel of Peru. Scarlet Bee Balm was a delight all summer long, and the Feverfew grew rank beside it. Who can forget the fragrant rows of Sweet Peas, which have never grown old-fashioned, and the swarms of Poppies of all kinds and hues, and the Clematis which climbed and trailed at its own will; and the wandering Honey-suckles and Sweetbrier which hummed with bees?

The charm of those old gardens was in their wealth and tangle of bloom. One plant leaned upon another. There was no room for weeds, for each flower stood cheek-by-jowl with a neighbor and frowned down the humble intruders. There was always a little shade in those gardens, perhaps a Pear-tree or two, or a choice Plum, which enjoyed the same care received by the blossoms, and rewarded in its turn with friendly shade. The spirit of those gardens came from the hands that tended them and culled their fragrant produce. They breathed love and thought and patient tending, and grew as flowers only grow for those who love them. Stiff in outline they might be, but the rampant growth of well-tended shrubs and perennials hid all straight lines and carpeted the paths with falling petals. One flower after another broke bounds and stretched over to its neighbor across the walk. The old Rose-bushes never would stay in place, but sent forth long shoots which dripped fragrance. The hedges were sweet with Haw-

thorn blooms; from the arbor came the breath of the Grape blossom as the long shoots waved in the summer breeze.

The fairest of these gardens were unsymmetrical ones, with winding paths that led by unexpected turns to some half-hidden bower wreathed in roses. Thither one strayed with hands full of flowers culled in passing, and, looking back along the path, saw arching sprays of color overhang and intertwine; and always there was perfume and wild charm and lonely grace in unexplored corners, and to one's dying day certain flowers, with their familiar odor, recall a scene perhaps vanished forever, and the old garden rises before the mind's eye ever fresh and fair and fragrant.

It is to be hoped that the taste for the renewal of these old gardens, with their fanciful suggestions, will grow, and that the vivid and practical young folks of the present day may learn to take an interest in them, and permit a little of the romance of the past to interweave itself with their memories. It is possible that there may be a revival of what is now scouted as "sentiment," even in our dry young Americans, who seem all for amusement and reform, and precious little for reflection and imagination. For them a garden is a botanical curiosity rather than a place for dreaming; and, alas! to many of them it is a bore. It may be that the fault is in the lack of suggestiveness of the modern garden, therefore let us hasten to make it once more the home of fancy and the graces like the ones which in our maturity we turn to with affectionate regret and loving memory.

An old-fashioned garden appeals to the mind as well as the eye, and whether formal or informal has about it something individual suggested by the mind of the owner. Its very tangles have a meaning, and its stiffness a significance. It is not one of many copies, but an expression, and that is what the finest gardens must ever be. In them one should read something of the characteristics of the guiding intelligence which shaped them into being and lifted them from mere conventional toys into works of art. While the landscape architect can suggest the general aspect of the grounds, the garden, which varies from year to year with changing plants, should reflect the taste and even whims of its owner, and in its general features take on characteristics of its own and become something beyond a mere show of curiosities. The plants of an old-fashioned garden were beloved, and are still justly beloved, for beauty and fragrance or for picturesque habit. He who would restore those gardens now, or establish worthy successors of them, should still cherish such shrubs and climbers as will give a perennial and familiar character to the whole scene, and let the new and strange be mainly the embroidery upon a garment of accustomed pattern. The arrangement may vary, but the theme should be the same from year to year, for what has been long an established fashion gains the charm of habit. There should be nooks where one loves to linger; corners where one Rose has blossomed for a score of years; shady beds where one may seek for shy wild flowers that have been brought hither from wood and hedgerow. There must be stretches where seedlings of all sorts, blown from the taller plants, will be sure to spring up without the care of sowing. One learns where to go for a flower in the dark, as for a book in a familiar bookcase, when time has consecrated the garden's arrangement; one side of the grounds may suggest reflection, the other labor, and room still be left for novelty and surprises. All this takes consideration and requires work and time; but the garden-lover begrudges neither to the perfection of his pleasure, and would value more lightly what cost him less exertion.

A large part of the charm of old gardens, as we have said, arises not so much from their splendor and luxuriance as from the affectionate toil and care they represent, which hallows the ground to us who remember the toilers. Into our modern grounds must be put the same thought and supervision if they are to mean anything to our successors or to bear real significance even to ourselves. Only by entering into the spirit which created the old-fashioned

gardens can we ourselves leave behind others which shall be valued by future generations as those of a former day are now.

A Northern Forest.

OUR illustration on page 285 of this issue gives a good idea of the appearance of the forests which cover the narrow bottom-lands of streams in the region between the Rocky Mountains on the east and the coast ranges on the west, and north of the forty-eighth degree of latitude —a region which includes a large part of the interior of British Columbia and portions of Idaho and Montana. The tall spiral trees in the foreground of the illustration, which is made from a photograph taken on the Thompson River in British Columbia, belong to a peculiar form of the eastern Black Spruce, *Picea Mariana*, which on these bottom-lands grows to its largest size, often shooting up to the height of nearly two hundred feet a narrow pyramid clothed to the ground with dark green fragrant foliage. Alders and Willows form shrubby borders to these streams, white with the melting ice of living glaciers as they start bravely out on their long and troubled course to the sea; and a solitary Canoe Birch, a wanderer from the east, sometimes enlivens the scene with its snowy bark and slender graceful branches. Over the hills which rise abruptly from the streams the forest spreads to the very edge of the glaciers. On these hills the trees are smaller than on the richer and moister bottom-lands, but their variety is greater. By climbing to the timber line one may see the Mountain Hemlock, *Tsuga Pattoniana*, the fairest of all Hemlocks, two Firs, *Abies amabilis* and *A. lasiocarpa* or *subalpina*, and Engelmann's Spruce, *Picea Engelmanni*. These four trees constitute the principal part of the forest, but with them at high elevations are scattered individuals of the White-barked Pine, *Pinus albicaulis*. Near the streams which flow from the glaciers the moist ground is carpeted with thickets of Menziesia and with Rhododendron *albiflorum*, a dwarf shrub which covers itself at midsummer with pure white fragrant flowers. A noble Aralia, *Fatsia horrida*, in great masses, with spine-covered stems, enormous leaves and clusters of scarlet fruit which recall the tropics, makes it hard to realize that summer here lasts only a few weeks. Ferns, too, and mosses clothe the ground with almost tropical luxuriance, and many northern under-shrubs display their flowers among the melting snows. Less varied in their composition than the great coniferous forest, nourished by the moister air from the Pacific Ocean, and far less imposing in the size of the individual trees, these interior forests of the north have their own peculiar beauty, and for the traveler from more southern lands the charm of novelty.

The June Flora of a Long Island Swamp.

ONLY those that have watched the gradual growth and development of a field of wild flowers can realize the amount of enjoyment that can be derived from the daily inspection of a few acres of marshy meadow-land. Every visit reveals new beauties, and usually new plants, that, no matter how carefully every foot of ground has been gone over before, have escaped the rigid scrutiny of a plant-lover's eye. The swamp that has been the source of much pleasure and entertainment to me for three successive summers is situated at the head of a small pond, where for a very short part of the winter the salt water penetrates, but it is, however, essentially a fresh-water swamp. The spring that fills it starts in a low meadow, a short distance off, and grows rapidly into a little brook that spreads itself into a broad expanse of bog, widening here and there into broader pools that harbor many a delightful water-weed, till it ends half a mile away in deeper and clear water in the pond. It is divided into three portions: a sloping peaty meadow, that gradually becomes too soft and wet to cross; a long boggy stretch, principally filled with rushes;

and further on, an almost impenetrable thicket composed of a variety of shrubs and small trees, such as Andromeda, Leucothoë, Rhododendron, Clethra, Viburnum, Myrica and many others, most conspicuous among which are the Swamp Maples, with their pale leaves, and some very Japanesque-looking Tupelos, *Nyssa sylvatica*. Between the meadow and the road is a long row of fine aged White Willows, which in beauty rival the Elms for which East Hampton is justly famed.

The swamp and meadow were first visited this year on the 17th of June, and, besides Daisies, Buttercups and white and pink Clovers along the upper dry portion, it was filled all the way down to the bog with Blue-eyed Grass, *Sisyrinchium Bermudiana*. The plants were so thick everywhere that it seemed scarcely possible to step without crushing a hundred, and so tiny that their color did not affect the general tone of the meadow as did the masses of Meadow Soft Grass, *Holcus lanatus*, the spikes of which were not yet in bloom. A more beautiful sight can hardly be imagined. Whether the salt air helps the color of *Holcus* or not, the manual does not tell, but surely it is nowhere as brilliant a silvery pink-purple as it is here, and, perhaps, for the same reason it is known to the farmers as "Red Top." Down nearer the bog, *Pogonia ophioglossoides* filled the grass with its little pink buds, with here and there a few in bloom. Splendid Yellow Thistles, *Cnicus horidulus*, were scattered around, and, notwithstanding their repelling name, are very handsome, decorative things to look at, but at the same time very awe-inspiring to the plant-collector. They are scarcely more than two feet high, usually lower, with a rosette of long, very prickly leaves, spreading flat on the ground; most beautiful leaves, too, with a broad reddish or reddish-purple midvein and margin, each prickle purple, with a yellowish tip. The flowers are pale, creamy-yellow, with splendid royal purple involucres.

Creeping through the grass everywhere were the little white flowers and slender shoots of the Running Swamp Blackberry, *Rubus hispida*, and the long branches of the Cranberry; but not a flower on the latter was to be seen, and nowhere in the swamp was a shrub in bloom. Here and there, all over the meadow, were fine clumps of the Flowering Fern, its rusty-brown fertile panicles towering above the tallest grass top and the shorter, paler green tufts of the Sensitive Fern. A slight stretch of the imagination will include in the meadow a waste strip of ground on the edge of the road, where the Lupin runs riot over the sand in long-stemmed, long-spiked masses of deep-blue Pea flowers. The contrast of the flowers against the yellow sand was very fine. The pod is also handsome, clothed with a long, fine down. Another prominent blue flower, but this one growing in the wettest part of the bog, is the little Blue Flag, *Iris prismatica*, a slender, graceful thing that at that time was abundant in every wet place.

The next day more Pogonias were in bloom, and here and there through the grass the Cranberry-buds were showing. The little Sundrops were more and more numerous, and rivaled the Buttercups in the brilliancy of their yellow. The species is that described in *Gray's Manual* as *Oenothera fruticosa*, var. *humifusa*, and is there accredited as growing only in Suffolk County, Long Island, and it is certainly very common here. It is, as its name implies, a low, spreading plant; its stems are somewhat woody, reddish, and, as well as the leaves and capsules, very puberulent, but the flowers are not by any means always small; some of them, when fully expanded, are over one and a quarter inches broad.

Careful search in a dry corner revealed the curious, delicate, little green Orchid, Twayblade, *Liparis Læselii*. Never found in great numbers, it is a pleasant surprise to come upon a little colony hidden among the grasses. It has a stiff, perky, independent way of growing, with two broad glossy leaves and a delicate spike of thread-like flowers. Often, too, the previous year's dry capsule clings to the old bulb, which persists for quite a while.

A couple of days later the first Wild Rose, *Rosa lucida*, was seen; the tall, somewhat flesh-colored stems of *Aletris farinosa* were noted among the grass, and off among the rushes faint white gleams told of the Wool-grass, *Eriophorum cyperinum*, that was beginning to bloom.

Two more days, and on the 22d, the *Pogonia* flowers by the hundred extended as far as the eye could reach, growing sometimes out of the water. There were so many of them that their perfume, a curious mixture of violets and vanilla, pervaded the atmosphere. They are charming, dainty things, and have a contented way of growing up out of the Sphagnum without any visible means of support in the bulb line, like their near relatives, the Twayblade. Another Orchid, *Calopogon pulchellus*, the *Pogonia*'s almost invariable companion, made its first appearance that day; it is taller, larger, bright magenta-purple, and very gaudy and self-assertive. There was only one of them in bloom, but little, round, greenish buds here and there at the top of slender flexuous stems told of many more to come.

The Arrow-wood, *Viburnum dentatum*, suddenly appeared in full bloom on the outskirts of the meadow, great flat cymes of snowy flowers that, unfortunately, were covered with that all-devouring pest in this region, the rose-bug.

Sunday, the 23d, was a dull day, and nothing new was noticed except that one Swamp Honeysuckle, *Rhododendron viscosum*, had ventured to put out a few blossoms. Everything else was doing its best to atone for the gray skies, and a marvelous sight they were, the rusty bog, with its fringes of bright green Ferns, dotted here and there with yellow Sundrops, the delicate purple grass in full bloom making a kind of iridescent veil over all the meadow, and above the great silvery mass of the old Willows against the leaden sky. A spell of wet weather followed, and when it was dry enough to penetrate into the meadow most of the *Sisyrinchium* had disappeared, and in the place of the little blue flowers were the many hundreds of small, hard, round, green capsules. The bloom of the Arrow-wood was also destroyed; many of the Red Clovers, *Trifolium pratense*, had turned brown; the Iris was fast shriveling, and the Wool-grass was very wet and bedraggled. The only things that had not suffered were the Pogonias, which, if possible, were larger, finer and more numerous than before. The Roses had come out, many of them, too, but mostly little dwarf things, only a few inches high in the meadow, where they were kept low by being cut down with the grass. Among the shrubbery the Black Alder, *Ilex verticillata*, showed its tiny round buds. They were scarcely larger than a common pin-head, but ready to bloom on the first sunny day. Both kinds are there—the staminate, with small sessile clusters; the fertile, with solitary little buds in the axils of the leaves. Here and there were the flexuous spikes of a *Habenaria* only six inches or so above the ground. The Star-grass, *Aletris farinosa*, was in bloom, an attractive plant, often found in sandy soil. It has a spreading rosette-like cluster of flat lanceolate leaves at the base on the ground and a solitary, tall, stiff stem with a wand of white flowers of the size and aspect of those of the Lily-of-the-valley at the top. The corolla is all crisped and wrinkled, and looks as if made of fine white paper crêpe, and just appearing at the top of the bell are six little orange-colored stamens. The yellow Loosestrife, *Lysimachia stricta*, made its first appearance that day, and the little sticky leaves of the Round-leaved Sundew, *Drosera rotundifolia*, were noticed in quantities riding on the top of the peat-moss.

A long week's rain ended the month, and on the last day the fog was too thick to see across the swamp, where the water stood deep in every depression, and the peat was as soft as a wet sponge, quite impassable, even to a weed-hunter. Once clear skies again, the July flowers will appear all the faster and be fresher and more brilliant for the good soaking they received in June.

Foreign Correspondence.

London Letter.

AN EXPERIMENTAL FRUIT FARM was established last year at Woburn, in Bedfordshire, by the Duke of Bedford, with the object of extending our knowledge of fruit-culture, more especially in the county of Bedford, and, generally, all over England. It is believed that ignorance of the best kinds of fruit and of the best methods for their cultivation prevails among farmers and market-gardeners, to whom, therefore, this experimental farm will be a valuable guide. There can be no doubt that in Bedfordshire, as in most parts of England, first-rate fruit can be grown, but the obstacle to its cultivation is the difficulty of obtaining anything like profitable prices for it. In the pages of *The Gardeners' Chronicle*, last year, there was a lively and most interesting discussion of the question, Does fruit-growing pay in England? The well-known novelist, Mr. R. D. Blackmore, who is also well known in this country as a market-gardener, held that apples and pears at any rate could not be grown at a profit. On the other hand, others, chiefly nurserymen interested in the sale of fruit-trees, held that given good culture, the best sorts, and care in marketing, hardy fruit paid well. The Duke of Bedford's farm will not teach much more than any well-managed gentleman's orchard has taught all along, unless the cost of the whole concern is carefully kept and balanced against what the fruit realizes when sold in the open market. "Scientific farming," which has been persistently pelted at the heads of old-fashioned farmers here for the last ten or twelve years, does not appear to improve matters; indeed, I have heard of farms which have got into a sorry mess through being in the hands of so-called scientific farmers, who generally have fads or make experiments which end in failure. With a fair chance in his own market the English farmer and fruit-grower can hold his own against the best. At present, however, he has no chance, and his occupation will soon be gone.

GARDEN HYBRIDS.—The origin of some of our most popular garden-plants is here the subject of animated discussion in both scientific and practical journals, the garden Cineraria being the bone of contention just now. It is held, on the one hand, that originally—say sixty or seventy years ago—several species of Cineraria were crossed, and from their progeny the present race of Cinerarias has been evolved. On the other hand, it is contended that, although it may be true that hybrids were raised as stated, all the evidence of any value goes to show that *C. cruenta*, a tall purple-flowered species from the Canary Islands, is the sole progenitor of the dwarf, big-flowered, variously colored Cineraria which is now grown in every conservatory. All the essential characters of *C. cruenta* are present in the garden Cineraria, while of the other species said to be concerned in its origin no trace is discernible. The historical evidence is conflicting, and supports one view as well as the other. The scientific value of the problem is in the light it is likely to throw upon the causes and extent of variation of which plants are capable; its practical utility is in the assistance it will render to breeders of plants. In my view, hybridization has had little or nothing to do with the "improvements" of the horticulturist among plants that are annually or at short intervals propagated by means of seeds. Thus, such plants as *Primula Sinensis*, *China Aster*, *Brompton Stocks*, *Gloxinias*, the *Turban Ranunculus* and *Cinerarias* are each the descendants of one species only. I should like to hear of a case of a race of garden-plants of the character of those mentioned which was originated by true hybridization. Tuberous Begonias will occur to many as an example, but there are botanists who do not believe in the specific differences of the plants from which these have been bred. *Streptocarpus* is another case which will occur to others as the most recent case of hybridization having resulted in an "improved" and varied race of plants. But I know from experience that in a few generations the one or other parent in each case becomes

entirely eliminated, and we get back to the species we started from. In other words, it is necessary to reintroduce the blood of the original parents into the seedlings to maintain variety and a mixture of characters. Of course, we have many beautiful races of garden-plants of quite respectable antiquity, and which are of true hybrid origin, such as *Roses*, *Rhododendrons* and *Pelargoniums*, but these are perpetuated by cuttings, grafts, etc., and not by means of seeds. To put the matter in the Darwin formula, slightly altered, Nature abhors hybrids, which, if not absolutely sterile, are so unstable that in a few generations the characters of one of the parents entirely disappear.

FINGER AND TOE DISEASE OF CABBAGES.—Mr. G. Massee, F.L.S., of the Royal Gardens, Kew, has published an interesting paper on this disease, also called "clubbing" and "aubury," which often destroys large crops of vegetables, upon the roots of which numerous nodules are formed, and these in a short time convert the whole root system into a slimy foetid mass. The disease is caused by a minute organism related to fungi, and its name is *Plasmodiophora brassicæ*. Mr. Massee goes further than most vegetable pathologists, in not giving only the name of the disease but in showing that, as the result of actual experiment conducted by himself, the disease can be prevented and even cured by very simple means. His conclusions, given in the following extract from his paper, are:

1. That in addition to cultivated plants, several common weeds belonging to the order Cruciferae are attacked by the *Plasmodiophora*. Hence the necessity for preventing the growth of such weeds in fields and hedge-banks.
2. That the germs of disease are present in soil that has produced a diseased crop, and retain their vitality for at least two years.
3. That the development of *Plasmodiophora* is favored by the presence of acids, and checked by the presence of alkalies, agreeing in this respect with the fungi rather than with bacteria.

4. For the purpose of sterilizing infected soil, experiments prove that either a dressing of lime or a manure containing potash salts is effective, the last being most valuable, as it not only destroys the germs in the soil, but also arrests the disease in seedling plants, and at the same time supplies one of the ingredients necessary for the healthy growth of turnips.

A NATIONAL CACTUS SOCIETY has been formed in England "for the scientific study of this most curious and beautiful family of plants and to foster a love for their cultivation." I am surprised to learn, from a circular published by the society, that there are 210 collectors and growers of *Cacti* in this country. It is intended to have exhibitions of the plants, to give lectures, and to publish an illustrated journal dealing exclusively with *Cacti*. The secretary of the society is Mr. E. B. Chapman, of Frome, who will be pleased to receive information of any kind relating to the introduction and cultivation of new and rare sorts. Judging by the number of catalogues and lists of *Cacti* received at Kew from the United States, there must be many to whom a knowledge of the existence of a Cactus society in England will be interesting. Fifty years ago *Cacti* were favorites with English amateurs.

London.

W. Watson.

Plant Notes.

RHODODENDRON MAXIMUM.—This is the Great Laurel, which is found in low lands from Maine to Ohio, but is most abundant through the Alleghany region from New York to Georgia. It is one of the best of our hardy Rhododendrons, and indispensable to planters who look to the permanent improvement of their grounds. It is one of the best all-round shrubs in cultivation, and, perhaps, the very best of the broad-leaved evergreens which may be depended upon, after it is once established, for winter effects, since it is so hardy that it needs no protection. It is also one of our best flowering plants, the charming pinkish white flowers coming in the greatest abundance at this

time of the year, when most shrubs have passed out of bloom. These Rhododendrons are particularly good this year at Forest Hill Cemetery, Boston, and it needs but a short visit to these grounds to be convinced of the important place which they deserve in planting schemes of the best sort. The specimens here are large, well developed, well placed and sufficiently numerous to give one an idea of the great attractiveness of the plant, and how well it harmonizes with other native growths and with some kinds of exotics. All these plants need for their best development is first a deep soil, which should be as fine as possible, yellow loam apparently being quite as good as peat, and then, when well established, they should have plenty of water during the hot and dry July and August weather, and this water should be given in large quantities, and not in driblets. They do not require water frequently, but unless they stand where their roots are in ground perma-

LIGUSTRUM IBOTA.—This fine Privet was introduced from Japan in 1861 under the name of *Ligustrum Amurense*, but it is only within the last ten years or so that it has been used to any considerable extent in ornamental planting. Even now it is not as frequently planted as it should be, but the fine clumps in the Arnold Arboretum are so attractive that they invite the attention of all who desire to increase the diversity of their plantations. This plant is a shrub growing some fifteen feet high, of compact and symmetrical habits, good foliage, and covered with numerous small white flowers, borne in short terminal spikes, which open late in June, after most shrubs have passed out of flower. It succeeds in any good soil, and the form which is planted in the Arboretum seems perfectly hardy in somewhat exposed situations. The propagation is by seeds, by hard-wood cuttings or by cuttings of the growing wood struck under glass in June; it is apparently as easily handled as



Fig. 40.—Forests on the Thompson River, British Columbia.—See page 282.

nently moist a sufficient amount should be given to thoroughly soak the soil. A mulch of leaves or clippings from the lawn is helpful, and some protection in winter is desirable for the first few years. The propagation is by seeds, but this should only be attempted by skilled gardeners. At the Arnold Arboretum many hundred seedlings have been grown during the last few years under glass and in frames, and after the first year the growth is very satisfactory. If small plants are obtainable, there is no great difficulty in establishing wild specimens procured from the woods and swamps. Any striking varieties which are found may be increased by grafting, using the improved veneer graft under glass during January or February. Stock is offered in limited quantities by most nurserymen. A wide field is offered for the hybridizer; it is curious that such a thoroughly good plant should not have received more attention in this direction.

any of the better-known Privets. Although the type of this plant which is grown at the Arboretum is perfectly hardy, there are other forms, sometimes obtained from foreign nurserymen, which do not succeed in our climate; they are apt, in trying seasons, to winter-kill—that is, the tops die to the ground, but the roots survive and make a good growth; these annual growths, however, do not produce any flowers, and so one of the great charms of the shrub is lacking.

ŒNOTHERA MISSOURIENSIS.—This is one of the best of the Evening Primroses, and is a most desirable plant for the herbaceous border. It is low and spreading, the leaves are long and narrow, the flowers are yellow, measuring three inches or more in diameter and are produced in abundance from June to August. The plant is hardy and requires no protection in ordinary situations. Its cultural requirements are simple, a fairly well-drained soil and

plenty of manure, with a slight covering of Pine-needles during the winter. The propagation is by seeds, which may be sown in March under glass, under which practice flowering plants can be had the following summer. Plants so obtained are good for several years, but the time comes when they deteriorate, and they should then be thrown away and new stock should be procured. *Oenothera taraxacifolia* very much resembles the *O. Missouriensis* in habit of growth and bears white flowers, which become pink as they fade. The two make good companions in the border. The plant is, however, not so hardy as the Missouri Primrose, and to insure success it is well to start new plants every year. Seeds sowed under glass in March will make good blooming plants the following summer. In some gardens both these Primroses propagate themselves by self-sown seeds.

Spiraea palmata.—This Japanese Spiraea is one of the most effective herbaceous plants in bloom. Its perfect hardiness, without any protection, its good habit, bright-colored flowers and clean foliage make it a desirable plant for any garden. Nevertheless, with all these good qualities, we rarely see a first-rate specimen. Some excellent plants are now flowering in the Botanic Garden at Cambridge, and Mr. Cameron writes that the plants were small when received a few years ago. They were set in a rich soil, where they grew rapidly, and now measure a yard across. The part of the rock-garden where these Spiraeas are placed is moist, and they are partially shaded by a large *Magnolia acuminata*. They will grow three feet high in such a location, or in good open garden-soil where they can find abundant water. In thin dry soils they will attain a height of little more than a foot, and much of their effectiveness is lost. They appear well near open water, and they never grow more thrifly and are never seen to better advantage than on the margin of a lake, especially if they can have partial shade. The flowers, which are borne in large corymbose panicles, are bright rosy crimson in color, and the palmate leaves are six inches across on plants which are well treated. *S. palmata* is readily increased by division either in spring or fall.

Cultural Department.

American Irises.

AMERICAN IRISES do not seem to have received the attention from cultivators that they deserve. It is doubtful if there be at this time a complete collection even of the different species in any one garden, while there are, no doubt, good varieties which have never been cultivated, and probably not even collected for herbariums. Again, there are varieties which have only a local reputation and which have not been generally distributed. I have found a number of varieties of this kind; some of these are not yet flowered here. Some of our Irises are most difficult to establish, and it will task the skill of an eastern grower to flower some of the west coast species, which resent removal and naturally are at rest during our summer season.

We have a trio of beautiful dwarf Irises in *I. cristata*, *I. lacustris* and *I. verna*, of which the first two belong to the crested section, or Evansia of the botanist. Of these, *I. cristata* (*I. odorata*, Pers.) is the prettiest and usually most amenable to cultivation. It increases rapidly if the short creeping rhizomes are planted in moist, light rich earth, though, on the contrary, it will grow vigorously on a rockery, where, however, it is likely to be injured during a hard winter. When covered in the spring with its light-mauve colored flowers, nothing could be prettier. *I. lacustris* has the habit of *I. cristata* and purple flowers with a yellow crest. It grows on the shores of the great lakes, where it is very plentiful. It thrives in cultivation in a moist soil, but is rather shy in showing its flowers.

Iris verna is a member of the subgenus (*Pardanthopsis*), of which there are only four species, the others being very rare. It has short creeping root-stalks, narrow, taller leaves, and no crest. Its flowers are dark rich purple, with yellow markings. It is a plant not uniformly happy in gardens, but not a difficult subject. Every one knows the common Flag of our eastern states, *I. versicolor* (*I. picta* and *I. sativa*, Miller), a plant which

thrives equally well in brackish, marshy, fresh-water swamps, or perfectly dry ground, and may be depended upon to hold its own under very adverse conditions. I have never seen any variations from the type, but Baker notes a variety, *I. Virginica* (*I. caurina*, Herb.) and *I. placcida*, Spach., as forms with some varieties of structure and coloring. I have also noticed in foreign catalogues other names as *I. versicolor* Kramer. It seems to me useful to note synonyms as warnings against accumulation of plants whose names in catalogues are often so many traps for the unwary. Some dealers even offer the same plants under different names at different prices. Our other common Iris, which is often nearly as thickly sown as grass in a meadow, is *I. prismatica* (*I. Virginica*, Gray; *I. gracilis*, Bigelow; *I. Boltoniana*, B. & S.). With its narrow leaves, a foot or more high, and purple flowers, this is a species which is graceful in habit and effect. Allied to *I. versicolor*, though a separate species and a distinct garden-plant, is *I. Caroliniana*, which was discovered a few years since by W. A. Manda in North Carolina. This has somewhat flexuous leaves, very slightly glaucous, brownish spathe valves and light lavender flowers of fine form. Farther south, on the Atlantic coast, is found another beardless Iris, *I. tripetala* (or *I. tridentata* of Pursh). This is interesting to the botanist, as having smaller standards than any of the narrow-leaved kinds of this section (*Apogon*). It is an attractive dwarf-growing purple Iris, flowering late in the season. While it is hardy here, it does not seem quite satisfied with our winter climate. After worrying most of the collectors on the coast, I succeeded in securing this from Florida. It is a plant in request among Iris fanciers, and scarcely to be had true from the dealers, who confound it with *I. Hookeri* (or *I. tripetala* and *I. tridentata*, of Hooker), which is a Canadian Iris with the habit of *I. versicolor*. Another southern Iris is *I. fulva* (or *I. cuprea*), with flowers distinct in color from any other species of the family, and of a spreading Morcea-like form when open. The form usually in cultivation has flowers of a rather dull coppery brown, but lately *Meehan's Monthly* figured, in a colored plate, a form with much brighter coloration in pinks and browns, so that there are evidently variations of this plant to be found. Beyond the Mississippi to the Rockies, we seem to have only one species, *I. hexagona*, though this is found also in the southern states as far east as Florida.

No Iris has given me greater pleasure this year than *I. hexagona*, var. *La Mance*, which was discovered last season in Benton County, Arkansas, and has been named in honor of Mrs. L. S. La Mance, the discoverer. This is much superior to the type, and has slightly pendulous leaves an inch or more wide and two feet high. The stems are spreading, leafy and bear several two to three flowered spathes. The flowers are large, with standards and falls both spreading and of a rich blue-purple, shading to white. The styles are light green. The plant in flower is very distinct in habit and most effective and striking. Besides the type, I have also an unflowered variety with flowers of a lighter hue. A friend in Florida has sent me a native form of *I. hexagona*, with white flowers. This rarity should be a great gain, white Irises being the quintessence of floral beauty. *I. hexagona* makes wonderful rhizomes, nearly round, an inch and a half in diameter and sometimes two feet long. Naturally it requires good lateral root-room and good supplies of moisture. Westward again, there is said by Coulter to be only one species in the Rocky Mountain basin, *I. Missouriensis* (*I. Tolmieana*). This is a narrow-leaved kind, with light purple flowers, the falls of which are reticulated. The flowers are small, but it is a vigorous species and rather attractive. Westward again we find a number of species and varieties, which, in a gardening point of view, form an interesting group. The list comprises *I. tenax*, *I. tenuis*, *I. macrosiphon* and varieties, *I. Hartwegii*, *I. Douglasiana* and varieties (*I. Beecheyana*, *I. Santa Cruz*, etc.), *I. bracteata*, *I. longipetala* and varieties.

Iris tenax, a linear-leaved species from Oregon and northward, offers no difficulty in cultivation here and flowers regularly, without special attention, early in the season. Its rather small light purple flowers are attractive. *I. tenuis*, figured in GARDEN AND FOREST, vol. i., page 7, I have not been able to secure, and shall be glad if some reader in Oregon would favor me with seed. Judging by its habit, it is probably a plant difficult to establish. *I. Macrosiphon* and *I. Hartwegii* I am growing from seed, having failed to establish them otherwise, though I have been favored with numerous apparently strong plants by Mr. Purdy and others. *I. macrosiphon* is said to be very handsome and free-flowered, ranging in color from yellow through the whites and purples. Mr. Purdy has transplanted this successfully to his garden on the Coast Range,

but, of course, his climate is not an eastern one, and the plants rest and grow under somewhat normal conditions. Herr Leichtlin has lately reintroduced *I. macrosiphon* to cultivation from seedlings, and we are likely to hear more of it.

Iris Hartwegii was first specially called to my attention a few years ago by an English friend, who is one of the best of amateur gardeners. He had once had it established, but had lost it, much to his regret. There may be others outside of California who have established it, but probably not many. The friend who sent me some plants this spring says: "Remember that they require a dry locality. They never drink a drop of rain from the middle of May till the end of September at the earliest, and they are to be found only on those hillsides where they are drained to perfection; never near a moist or wet spot. I do not recollect having found them on any but dry slopes, and there strong in the sun, and slim and thin if shaded too thickly by Pines, *Pinus ponderosa*." Strong roots and thin roots have mostly gone quickly to the majority in my garden, though at present there are some survivors under cover and dormant, besides seedlings. It will be seen that such plants are likely to cause a gardener some trouble. If we are to grow some of the California and many of the Asiatic plants it will be necessary to arrange a summer drought for parts of the garden. There is also another little matter which bothers a gardener in growing some of the early-flowering plants—our seasons are sometimes so late that the plants do not move until their natural flowering season is over, and this is apparently prejudicial to their perfection. There is a great difference in the temperature required to start perfectly hardy plants, for a plant may be perfectly hardy and yet require quite a warm temperature to start it into vigor. Bamboos, for instance, being a case in point. *Romneya Coulteri*, which is a true Californian, did not appear this year till the first of May, about the time it should be in flower, and it will probably not catch up. *I. Douglasiana* has several varieties, and Mr. Purdy informs me that he has seen some beautiful natural hybrids with some other species. Of these and *I. bracteata*, figured in *GARDEN AND FOREST*, vol. i., page 43, I have had little experience beyond losing them one or more times. *I. longipetala* is a species which seemingly requires no special treatment, and has grown here for some years with so little attention that I do not at the moment remember the distinguishing features of its purple flowers.

This seems to complete the list of known American Irises, except *I. setosa* (*I. brachycuspis*), which is found in Alaska, and is possibly an escape from Asia, where it is said to be rather common.

These notes, which, perhaps, give a large proportion of negative information, are offered in the hope that observers of our native flora may be induced to notice and collect Irises which may differ from the types, and favor us with notes on the natural habitats of some of the little-known species.

Elizabeth, N. J.

J. N. Gerard.

Midsummer Care of Chrysanthemums.

SPECIMEN plants of Chrysanthemums are now making vigorous growth. It is important at this time, more than any other, that an even and compact growth be secured; hence careful stopping is one of the most important operations. Every day the plants should be looked over, and any shoots making unusual headway nipped off. This work may be continued until early in August with most varieties, and even later, when an occasional shoot strikes out above the rest, as will sometimes happen with G. W. Childs, Octavie Mirabeau, Portia and Iora. The Louis Boehmer type, Ivory and varieties generally of slender growth are better if they are allowed to mature their growth early, so that stopping may be discontinued about the middle of the month. Experience, however, is the most reliable guide, and to note each individual variety in this particular would be tedious work.

In point of size, our specimens in July are never in any way remarkable, and we are often warned that at exhibition time we shall be behind. Our aim has not been to have our plants make unusual growth, but rather to develop a good foundation. To this end we have never used very rich soil, as heavy growth early in the season tends to an abnormal root development, and increases the difficulties as well as the dangers of feeding or applying stimulants later on. To put it plainly, the plants are surfeited, to begin with. A loss of leaves will be sure to follow, and without good foliage we cannot have good flowers, neither can we make a finished specimen.

Skill lies rather in the application of stimulants than in their choice. General lines of work may be laid down, but each must to a considerable extent experiment for himself. There

are plenty of good compounds to choose from. As stated in previous notes, enough room should be left, when making the final shift, to allow for a top-dressing of good soil manure of some kind, or whatever is decided upon for a fertilizer. We apply a top-dressing before we find it necessary to use stimulants in the liquid form. For this purpose, cow-manure is good, but it must not be applied green. In this condition, it would quickly close the pores of the soil and shut out air, so essential to healthy development, when stagnation would result. This is generally shown by the leaves becoming yellow. Cow-manure should be dried and put on rough and allowed to remain so. We do not, however, use it, for the reason that it is bulky and does not contain enough concentrated food. Sheep-manure is excellent, but this also is objectionable for use in pots, on account of its bulk, though to a lesser degree than cow-manure. Partiality may be charged in recommending one artificial manure above another, but I must say that Clay's fertilizer is by far the best and safest of any I know, and I can fully attest to its lasting qualities. One part in fifty, or even more, can be incorporated into some good loam, with a dash of sand to keep it from forming a compact surface; this makes an excellent first top-dressing. Enough may be used to make a covering of about one-fourth of an inch. The effect of this compost will be seen in a few days. I have already tested a plant of Ivory, which, by comparison with the rest, shows increased vigor and improved color. Guano may be used in the same way in smaller proportions, but it is dangerous, and owing to the uncertain strength of the article under that name now in commerce it is unreliable.

Later on liquid-manure can be used. Drainage from barns is one of the best fertilizers known, containing in a concentrated form all the ingredients of a complete plant-food. One part in twenty gallons of water is a good proportion to use, applied two or three times a week. The plants must be healthy; a sickly plant would not be benefited, but rather injured. Plants in this condition are either constitutionally weak or else there is a defect in the drainage, and the roots should be examined. Bituminous soot, put into a bag, with some device for filtering water through it, is beneficial, often giving a healthy tone to a weak plant when all other remedies fail. An overdose of stimulants is sure to occur where a large quantity of plants are grown. Where this occurs it is better to leave such plants rather dry until the air has had a chance to work through the soil with deodorizing effects. Water should be continued sparingly, for, since the trouble is root-injury, some time must elapse before normal root-action sets in.

Insect pests must be fought continuously. Fumigation for most of the aphis family is usually sufficient, but not effective enough for black and yellow thrips. A decoction of three pounds of tobacco-leaf in twenty gallons of water, with an ounce of sulphide of potassium dissolved, and a tablespoonful of kerosene-oil to a pailful of water on application, has proved effective.

Plants intended for specimen blooms are now making good growth, and will soon need staking. The July crown-buds are showing quite numerously, and, except when appearing late in the month on some early varieties, which are good on this bud only, notably Mrs. E. G. Hill, all should be discarded, and the terminal bud allowed to grow.

Wellesley, Mass.

T. D. Hatfield.

Some Showy Perennials.

THE native Pentstemons are beautiful plants, but many of them are hard to cultivate. Young plants are easily raised from seed, and if this is sown early in spring some of the seedlings will bloom the first summer or autumn. Somehow, many of the species never seem to grow so well here the second year. Even when they are kept in a cool frame during the winter and are planted out in the spring, or if they are left in the border and protected, they start to grow so weakly in the spring that they make a poor display in the summer. However, we have a number of showy species that are quite happy here, and they greatly help to adorn our beds and borders. *P. barbatus* makes an attractive plant when in bloom. It is one of the most robust growers, and makes itself at home in almost any kind of soil or situation. It grows in tufts, and from those tufts rise slender wand-like stems with lanceolate pale green leaves, and the light pink drooping flowers are borne in long loose panicles. The flower-stems are produced plentifully, and the plants are attractive for a number of weeks. There are several varieties of this species, but the best one is *Torreyi*. It is a robust plant, growing taller and stronger than the type, and bears beautiful deep scarlet-red flowers. The

species is found growing wild in the mountains of Colorado and New Mexico, and the above variety is found on the western border of Texas to Colorado and New Mexico. *P. ovatus* grows nicely here, and has open panicles of pretty blue flowers. It is about two feet high and has ovate toothed leaves. *P. laevigatus*, var. *digitalis*, makes a desirable plant for the garden. In the third row from the front of the mixed border it grows vigorously. We have also a large bed in the rock-garden, where the plants are pretty well shaded during the hottest part of the day. In such a position the flowers have lasted longer and the plants look as healthy as if they stood in a sunny situation. This is a strong plant with an upright habit and large lanceolate leaves. The compact panicles of whitish flowers are showy, and last for several weeks in good condition on the plants. *P. diffusus* is a half-shrubby species, with a constitution able to stand our severest winters. The color of its flowers is violet-purple, and they are produced annually in great abundance. Its height is two or three feet, and it makes a good border-plant in an open position and rich soil. *P. pubescens*, though not as showy as some of the species, thrives here, and when well grown it makes a neat small bush a foot or more high, with dull violet flowers. *P. confertus* is a low-growing plant with sulphur-colored flowers, which does well in the front row of the herbaceous border.

Last year I gave some testimony as to the hardiness of *Alstroemeria aurantiaca*, but this year I have been disappointed with it. Plants that had been established in the rock-garden for two years, and which I thought were perfectly hardy, were all winter-killed, and not even one stem appeared above the ground last spring. The question which now suggests itself is, when can we call a plant hardy? The lovely *Anemone Japonica* and its white variety have been grown here successfully for the last seven or eight years, but last winter was very severe upon them and very few of them were alive in the spring. Although the plants were killed last winter, yet we must not say they are not hardy, because many of our native plants were hurt with the severeness of the weather. The experience of last winter has taught us a lesson to be always careful with plants that are of doubtful hardiness, and to give them the very best position that can be obtained for them. Perhaps the reason why the *Alstroemeria* died was because it was planted where the water at one time last winter lodged around its tuberous roots. It must be remembered that this plant likes a deep, rich sandy soil and a position where its roots will be dry in the winter. We have a large plant in bloom now that has not been disturbed for the last six years. It measures four feet across, but it would have covered much more space if it had been allowed to grow. It has to be checked or it would smother its nearest neighbors which are of a less aggressive character. The plant grows on the north side of a hedge, where it is covered heavily with leaves in the winter, and a shutter is laid upon the leaves. Perhaps the reason why this plant survived the winter is because the shutter helped to keep the moisture away from the roots when they were dormant. This *Alstroemeria* is a herbaceous, tuberous-rooted perennial from Chili. It has erect stems clothed with linear-lanceolate, glaucous green leaves, which are curiously twisted at the base. The showy flowers are of a bright orange color and are produced in the form of a terminal umbel. The plants blossom for several weeks, and well-established specimens produce large heads of flowers, which are greatly admired.

Harvard Botanic Garden.

R. Cameron.

Three Good Plants.

Clerodendron squamatum.—A plant of this semi-shrubby Clerodendron, recently obtained from Japan, proves to be valuable for pot culture. It is not commonly seen in cultivation and is a native of China. The foliage is large and handsome, resembling very much that of the Catalpa, the growth being perfectly erect, with terminal heads of brilliant scarlet flowers. The flowers and the calyx are alike in color, so that the flower-cluster is attractive before any of the flowers have expanded. The plant is fond of sunlight. It was grown in an unshaded house during all the hot weather we had early in the season. It would be likely to make a fine subject for planting outdoors in the extreme south and also in California. When the specimen was obtained we were under the impression that it was the plant known under this name some fifteen years ago, which was a climber requiring a warm house and bearing bright red flower-heads in the middle of winter, with rich dark green shining foliage. That plant was evidently misnamed. I should be glad if Mr. Watson could tell me if there is still such a plant in cultivation in England or elsewhere. It would be

a valuable winter-flowering climber for a warm house could it be obtained.

Hæmanthus Kalbreyerii.—Though not a new plant, this seems to have been reintroduced into cultivation during recent years in quantity, and it has been possible to obtain this, the best of the Blood-flowers, at a reasonable price. We find that there is no difficulty in growing and flowering it if treated the same as other summer bulbs that are grown in the greenhouse. Ours were obtained last fall and placed in dry soil until spring, when signs of growth commenced. We were soon rewarded with flower-spikes, not so strong as they will be after good cultivation for a year or two, but the plants are growing vigorously in a warm, half-shaded position in the greenhouse, and we hope to have good strong spikes next year. We used to have *Hæmanthus puniceus*, and flowered it several times, but it is not worth the space it occupied in the greenhouse. The flower-stem was short, and the head of flowers not spherical like that of *H. Kalbreyerii*, which is the best of the genus, and worthy a place in any greenhouse where things a little out of the common are appreciated. In *Nicholson's Dictionary* the height of the plant is given as six inches; this is misleading, for our plants are now about three times that height and still growing. The flower-stems are produced when the plant is about a foot high, and the stems are equal in height to the foliage. This species is a native of tropical Africa.

Crinum Kircape.—Through the kindness of Mr. T. L. Mead, of Oveido, Florida, I have a fine plant of his new hybrid *Crinum* now in bloom. It is a cross between *C. Kirkii*, a species from Zanzibar, and *C. Capense*, from south Africa. This is one of the interesting results of the work of this careful hybridist. From the bulb sent me last winter we have already had three strong flower-spikes, each bearing about a dozen sweet-scented white flowers with a decided rose-colored stripe down the outside of each petal. The plant has been in continual bloom from the time the first flower opened, one flower-stem coming after the other in quick succession, and the plant has been in the dwelling-house for some time. I am not aware that any attempt has been made before to hybridize with these *Crinums*. I have raised seedlings myself from *C. Capense*, and flowered them, but in Florida, where they are hardy and need no special care in winter, they must be beautiful in summer. Mr. Mead has given the plant a compound name, in accordance with the custom now often adopted with the hybrid progeny of Orchids. If, as I believe, the cross has not been made before, there seems no reason why the name is not a good one. In general appearance the plant resembles *C. Kirkii* more than *C. Capense* (*C. longifolium*). The latter parent should, however, give the plant hardiness. The species is commonly grown out-of-doors in Great Britain, and is generally hardy in favorable locations. It would doubtless be hardy in many states besides Florida with a little winter protection.

South Lancaster, Mass.

E. O. Orpet.

Strawberries.—Some novices in Strawberry-growing, who are investigating the value of different varieties, should be advised that some of the very best are the poorest unless they are highly cultivated. Among the recent varieties, Beverly and Barton are about worthless if they are grown like Cumberland, which, as is well known, will endure neglect better than most sorts. Yale is worse than a weed if it does not have particularly good culture, but is a fine variety if highly fed and well worked. In selecting varieties look for those which make a strong plant-growth, as those which give inferior foliage must, in the long run, be discarded. Marshall and Brandywine are strong growers among the native kinds. Haverland, also a heavy producer on medium strong soil, has weak stems and does not lift its berries off the ground.

Clinton, N. Y.

E. P. P.

Correspondence.

Stones, as a Source of Fertility.

To the Editor of GARDEN AND FOREST:

Sir,—Our soils, at least in north-eastern America, are the product of glacial action. I am myself living upon a great moraine, where once was a vast glacier, which dug out and formed the bed of Lake Memphremagog and its tributary valleys. The marks of glacial action are all about me upon my farm, two miles from the lake, and about five hundred feet above its surface—that surface being itself eight hundred feet above sea-level. After the great glacier disappeared, or while it was in the course of dissolution, vegetation sprang up, and soils were gradually formed by the conjoined influ-

ences of water, frost and vegetation. It is to the part which vegetation then took in this work, and has ever since been taking to this day, that I wish in this article to call attention. This farm is in every characteristic distinct from another, upon the shore of the lake, which I have owned for nearly thirty years, and which consists, down to and below the water-level, of fine gravel and sand. This was covered, when the country was opened, less than a century since, with a heavy growth of mammoth Pines, some of which were of almost incredible girth and height. It is now divided into fine level farms, extending back about a mile from the water. Then begins an ascent of two miles to another plateau, extending for some ten to fifteen miles, gradually and then more rapidly rising to the watershed between the Memphremagog basin and the valley of the Connecticut River. It is upon this first bench that the farm first referred to is situated.

It appears, on a mere surface examination, to consist of a soil nearly as light, as regards its finer constituents, as the lake shore territory, but encumbered with stones of all sizes, from coarse gravel to large boulders, most of the latter having been removed in the sixty or more years since the farm was first opened. The slope toward the west is moderate, offering a magnificent outlook, not only toward the grand range of the Green Mountains, but to all points of the compass. This farm has passed through many hands, but has never been unoccupied; and it has had the reputation of being "a good farm to a good farmer." I bought it because the winter range of the thermometer at this elevation is not so low by several degrees as near the lake, the cold air "settling down" into the lowlands. This difference is shown by the fact that the Tolman Sweet Apple, while a failure by the lake, succeeds well at this elevation; and this is the case with many other of the almost hardy varieties, making it particularly valuable to a fruit-grower. But, besides this, it is particularly interesting as affording an opportunity to study the formation of soils—a subject which has interested me greatly, almost from my boyhood.

Many, very many loads of loose stones have been carted off from this farm, and it is now in good condition for the use of all farm machinery; but the peculiar thing about it is that, so far as it has been examined, it appears to be underlaid by a stratum of clay of unknown thickness. This clay seems to be almost free from small stones, though containing many water or ice worn boulders of the same character with those found upon the surface. Many of these are of granite, but some are of softer rock, approaching to slate, and some of these are of easy cleavage. On these I have long noticed the appearance of corrosion by the solvent action of the roots of trees and plants; and this has led me to the conclusion that this erosive action has a good deal to do with the formation of soils and the maintenance of their fertility. I believe that tillage and the application of manurial matter tends to increase this action, and that in this way we get a double influence, tending to the improvement of the soil.

As to the actual disintegration of stones by the roots of trees and of smaller vegetation, I think no observing person can doubt the fact when his attention is directly called to it. The lines of corrosion can be seen in thousands of instances on mossy stones, even of granite, though more distinctly on slates and limestones. Careful removal of the moss will reveal the fine roots lying shallowly, but plainly, in the minute creases which they have made. It is not the moss alone which thus erodes the stones; other vegetation has the same action. Chemical analysis reveals the presence of mineral matter as an organized constituent of plant tissues. On the death of these plants this mineral matter which they have taken up is relegated to the soil, and constitutes the mineral plant-food for succeeding generations of plants. Thus our farm-lands are being, so to speak, renovated—or, as farmers are wont to say, "rested"—by lying fallow.

It seems to me that this action of plant-roots in preparing their own mineral nutriment has not had due weight given to it by writers on agriculture. It acts in coöperation with the solvent operation of the water of the soil to render the mineral elements available, and thus we may say that plants devour rocks and turn stones into bread!

T. H. Hoskins.

[It is well known that most soils are made up of minute fragments of rock which have been pulverized and decomposed, and the texture and fertility of a given soil may be often known from the constitution of the original rock from which it was made. Besides the well-known wearing action of water and air, the chemical action of substances dissolved in the water and the disruptive power of

ice, dead vegetable matter and living roots are both recognized as disintegrating forces. Certain substances, generated by the fermentation and decay of plants, help to soften rocks with which they come in contact, and it is often noticed that the surface of a rock under living lichens can be scraped away when the bare surface of the same rock remains hard. There are acids in the juices of plants which have a solvent power on rock, and that the root-hairs of other plants have a similar effect is proved by the common experiment of sowing seed in sand which is placed on a marble slab. After the seedling has started, the roots adhere to the slab and eat into it, so as to leave their impression visibly upon it when the roots are removed. If we include the action of tree-roots which helps to split open rocks, the great mass of vegetation in the soil during a period of years will be an important factor in converting stones into soil, but, of course, it is impossible to estimate just to what extent they are effective in this work.—ED.]

Recent Publications.

Ten New England Blossoms, and their Insect Visitors.
By Clarence Moores Weed. Boston and New York : Houghton, Mifflin & Co.

This little book differs from many of the popular treatises which have to do with flowers, some of which are mere rhapsodies, consisting mainly of exclamation points and adjectives in the superlative degree, with no intelligible or continuous purpose. Mr. Weed, fortunately, has some accurate knowledge of his subject, and he has formed a distinct and coherent plan of treatment. In the first place, it is not devoted to descriptive botany, and it does not aim, primarily, to describe the forms and colors of flowers, nor to count and measure their different organs, but it is devoted to the one purpose of showing how these ten well-known flowers have adapted themselves to the wants of their visitors and how the structure of the visitors has been developed to help on the reproductive processes of their hosts. Of course, the little book makes no pretense of originality, but a very careful selection of flowers has been made to illustrate how odor and color catch the attention of the wandering insect and advertise the fact that nectar and pollen can be had for the taking. The structure of each flower, so far as this is related to the act of pollination, is given and figured, and the bees and moths and butterflies and other insects which accept this invitation are in like manner described. In an easy and generally pleasing style all the devices of the plant and the organs of the insect which coöperate to insure the gathering of pollen from the stamens of one flower and transporting it to the stigma of another flower and fastening it there are clearly explained, and to young and receptive minds this revelation cannot but be a stimulus to further study. For the value of the book does not rest altogether on the array of facts set forth, but rather in helping to stir the spirit of original discovery in every one who has the privilege of watching flowers and insects and noting the relation between the two. Of course, it is necessary to use scientific terms in treating such a subject, but in a few cases we think Mr. Weed has been needlessly technical, as, where he says, for example, "this Mayflower at Hanover is tending toward a more perfect diœcism." This is a question of judgment, however, and in the main there is nothing repellent in the language, and any bright boy or girl can follow the argument without difficulty. Altogether, it is one of the most successful attempts to set forth in a popular way some reasons why the organs of plants have assumed their present form and texture and covering, and how nicely the habit and structure of their insect visitors are adjusted so that plant and insect coöperate to meet each other's needs. The book is well illustrated and clearly printed, and it can be commended to any inquisitive child, be he younger or older, whose attention has not been directed to this striking example of structural correlation.

Notes.

Large quantities of the dark red fruits of *Prunus Simoni* reached the eastern market in excellent condition during the first weeks of July from California, and have appeared on the fruit-stands as apple plums, an appropriate name, as they resemble in shape and color some of the small autumn apples, while the flavor also suggests an apple. The fruit of this curious Chinese tree, which is intermediate between the Plum and the Apricot in its characters, apparently travels well, and as it ripens early promises to be a good addition to our early summer stone fruits.

A Pennsylvania farmers' club has been testing the amount of shrinkage by weight of Indian corn which is kept over the winter. The results coincide generally with what has already been reported from tests made at the experiment stations. Between husking-time and the first of June corn will lose about one-sixth of its weight, and allowing for other losses and expenses it was agreed that it would be as profitable to accept forty cents for a bushel of corn in the ear at husking-time, as it would be to receive fifty cents for the same amount on the first of June or thereabouts.

Growers of English walnuts in California are complaining of a disease which appears as a black spot at the apex of the nut. Some fungus or insect seems to destroy the tissues of the nut-hull, and after this rind is penetrated it is supposed that a bacillus enters and disorganizes the tissue next to the nut proper. An agent of the Department of Agriculture has been studying the disease and recommends the winter spraying of the affected trees with Bordeaux mixture, although he confesses that this treatment is suggested only as an experiment, for the cause of the disease has not yet been satisfactorily worked out.

The Butterfly-weed, *Asclepias tuberosa*, may well stand as a representative plant of our hot dry midsummers. In sterile sand or the open gravel of thirsty uplands, where other plants can hardly exist, its flowers are resplendent with a vivid orange which approaches red in some individuals, and pales toward yellow in others, those which chance to become established in rich or moist ground showing usually the most red. There are places in the garden border where these brilliant flowers can be effectively used, but, after all, they never make so strong an appeal to the eye or to the imagination elsewhere as they do when glowing on some parched and lonely hillside.

The Wisconsin red oak has for several years taken high rank in furniture and finishing factories on account of its softness, adaptability to shop work, its lively color and figure. When plain-sawed it commands higher prices than any oak, although quarter-sawed white oak is more expensive. According to *The North-western Lumberman*, this Red Oak belt in Wisconsin is not wide, and at the rate the timber is being cut off it probably will not last more than six or seven years. In the north-west part of the state, which is not yet opened up by railroads, there is a heavily timbered area which may contain much Red Oak, but it will soon be traversed by a railway from Duluth.

The latest issue of the *Revue Horticole* to reach us contains a colored plate of the curious and beautiful *Lotus peliorhynchus*, an exceedingly rare plant of the Canary Islands, where it grows exclusively on Teneriffe on rocky cliffs of the ravine of Tamadava. The curious bright red flowers, hooked like the beak of a parrot, recall in general aspect those of an Erythrina or a Dianthus, rather than the flowers of a Lotus. Like many other plants of dry regions, it does not adapt itself particularly well to greenhouse cultivation, but will doubtless prove to be an admirable plant for southern California, where it may be expected to find the conditions necessary to develop its long, slender, graceful branches and brilliant flowers.

An enterprising farmer in Simsbury, Connecticut, turned the course of a brook on his place through a canal six feet wide along the slope of a hill, and placing a hydraulic ram seven or eight feet below the extremity of the canal he forced the water sixty-five feet upward through a three-inch pipe into a pond which held 300,000 gallons. This pond he made by throwing up an embankment in a well-selected spot on the hillside. Having bought three hundred and fifty feet of damaged fire-hose at fifteen cents a foot and adjusting a large sprinkler at the end he was ready to irrigate his Strawberry patch. According to the *Rural New Yorker*, a student from the Storrs Agricultural School was detailed to watch this irrigating scheme, and the result was that plants in the watered rows yielded considerably more than twice as many pounds of berries, which were larger, brighter and more attractive than the fruit on unwatered rows, and they were in great de-

mand at high prices when ordinary berries could hardly be disposed of at all.

Bulletin No. 4 of the South Dakota Agricultural College and Experiment Station contains a list of the native trees and shrubs of South Dakota, by Professor Thomas A. Williams, botanist and entomologist of the station. One hundred and seventeen species of woody plants are included in this report; of these thirty-seven are trees, seventy-four are shrubs and six are woody climbers. The region is interesting from the fact that it is the meeting-ground of representatives of the eastern and western floras, the eastern Hop Hornbeam, for example, *Ostrya Virginiana*, being abundant in the Black Hills and in the north-eastern part of the state, while the Yellow Pine, *Pinus ponderosa*, of the west, is the common and only species in the same region. The arborescent vegetation, however, is rather eastern than western, as among the thirty-seven trees, in addition to the Pine, we find only the following inhabitants of the Pacific forests: *Populus angustifolia*, the Narrow-leaved Poplar of the Rocky Mountains; *Salix flavescentis*, a species widely scattered all over western America and found in the Black Hills in a shrubby form; *Betula occidentalis*, *Cercocarpus parvifolius* and *Acer glabrum*. The other species belong either exclusively to the eastern flora, or, like *Juniperus Virginiana*, *Betula papyracea* and *Picea Canadensis*, range across the continent.

In the July issue of *The Botanical Magazine*, Sir Joseph Hooker describes *Pyrus crataegifolia*, a small bushy tree which grows spontaneously in woods near Florence, Bologna and Lucca, and in a few other localities in northern Italy. Its nearest ally appears to be *P. terminalis*, from which it differs in the more cordate base of the leaves, which are incisely serrate and tomentose on the lower surface, and in its simple terminal corymbs of long-stalked flowers and in the small ellipsoidal red fruit. It is the *P. Florentina*, *Mespilus Florentina* and the *Crataegus Florentina* of some authors, and appears to be an exceedingly rare plant, both in its native country and in cultivation. So far as we know, this pretty and graceful species has not yet been introduced into the United States. Among other plants of horticultural interest figured in this issue are *Rubus lasiosystylus*, a Chinese Raspberry, from central China, where it was discovered in 1888 by Dr. Augustine Henry, and *Senecio Huatata*, one of the group of gigantic herbaceous Ragworts, natives of extra-tropical South America. It is a tall stout herb with a towering stem five feet high and great radicle leaves, sometimes eighteen inches long and from four to six inches broad, and a pyramidal panicle of crowded clusters of pale primrose-colored flowers. At Kew, where this plant was raised in 1890, it proved perfectly hardy and flowers profusely.

Some thirty car-loads of California fruits, other than oranges, were disposed of in this city during last week. Among pears were Bartletts, Clapp's Favorite and Bloodgood. These are not yet fully grown and so are undersized and lacking in color. St. John, the earliest yellow peach to come from the western coast, now brings the highest prices paid for this fruit, \$2.15 a box, at wholesale. Twenty car-loads of California oranges were sold at auction during the same time. The fruit was of good quality and the best brought \$3.00 to \$3.50 a box. Notwithstanding the arrival of about 165,000 packages of Mediterranean lemons within the past fortnight, the demand from western cities has made ready sales and prices have been high. Sicily lemons of the grade known as extra fancy command \$4.50 for a box containing 300 fruits, and those known as fancy, from Majori, bring \$6.50. Plums of contrasting colors give variety to the fruit-stands, as the large, roundish-oval Washington, a yellowish-green; the large flat Simoni, bright orange and red; the Satsuma or Blood Plum, introduced from Japan by Luther Burbank, its common name suggesting the color of skin and flesh. These sell for forty to fifty cents a dozen, the popular Tragedy prune costing twenty-five cents. Other varieties offered are Royal Hative, Peach, Duane Purple and German Prune. Bananas continue to arrive by the steamer load, one importer alone having twenty-one chartered vessels in this service. This fruit has recently been exceptionally good and prices last week advanced on an average of twenty cents, bunches of the largest size from Jamaica, Aspinwall, Sama, Banes and Port Limon selling for \$1.25 to \$1.50 by the truck load. A few boxes of Chasselas de Fontainebleau grapes are here from California. Crates of the Russian Alexander apples and the more showy white-fleshed Red Astrachan, from the same state, sell for \$3.00 in the wholesale markets. Large, showy nectarines, from New England hot houses, are shown in the fancy fruit-stores and cost forty cents apiece, and grapes grown under glass in the same section sell for \$1.75 a pound.

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLES: —Doing Too Much.—I.....	291
Additions to the Arnold Arboretum.....	292
Plant-breeding at the Experiment Stations.....	Professor E. S. Goff. 292
Birds of the Arnold Arboretum.....	C. E. Faxon. 292
On the Tanning Properties of the Bark of Three North American Trees,	Professor Henry Trimble. 293
FOREIGN CORRESPONDENCE: —Pelargoniums.....	W. Watson. 294
NEW OR LITTLE-KNOWN PLANTS: — <i>Carpinus cordata</i> . (With figure).	C. S. S. 294
PLANT NOTES:	295
CULTURAL DEPARTMENT: —Some July Flowers.....	W. E. Endicott. 296
Hardy Perennials.....	F. H. Horsford. 297
Fancy Caladiums.....	William Scott. 297
<i>Papaver bracteatum</i> , <i>Dipladenias</i>	E. O. O. 297
THE FOREST: —The Need of Forest Schools in America.....	Gifford Pinchot. 298
CORRESPONDENCE: —Strawberries in Wisconsin.....	George J. Kellogg. 298
Poison Ivy.....	S. F. Goodrich. 299
Common Plants.....	M. 299
Southern Pines (North Carolina) Experimental Farm.....	L. J. Vance. 299
RECENT PUBLICATIONS	299
NOTES:	300
ILLUSTRATION: — <i>Carpinus cordata</i> , Fig. 41.....	295

Doing Too Much.—I.

A N utter neglect of the grounds of small country places, occupied only during the summer months, was a common sin in America a generation ago. It was especially common in seashore regions, where, moreover, it often seemed that as little thought as possible had been bestowed upon the house itself. No sight was more frequent than the ugliest of bare cottages, unadorned by the architect or the planter, surrounded by grounds which had unavoidably been tampered with and vulgarized in the process of building and road-making, while no effort had been made to restore them to their primitive condition or otherwise make good their loss of Nature's kind of beauty and orderliness. Of course, when many of these unkempt little places existed near one another the general effect of the "colony" was even more distressing than the effect of each of its component parts. And then the constant thought of the sensitive observer was that something "ought to be done"—that Americans ought to be taught to beautify even the most transient of their summer homes, or, at least, to keep their surroundings in a reasonably neat condition.

Times have now changed in this respect, and, on the whole, conspicuously for the better. It is certainly better, whatever the immediate outcome of the change, that people should bestow thought and pains upon their summer homes—should take a real interest in them—than that they should regard them with indifference, merely as needful places to eat and sleep in. It is better as regards the aspect of our summer resorts even when individual results are not as successful, as genuinely artistic, as they might be, and it is distinctly better as testifying to mental and aesthetic growth on the part of those who build and inhabit them. But with the usual impetuosity of the American temperament, we have already begun to go too far in pursuit of our newly embraced aim. From the doing of nothing we are steadily developing a tendency to do too much in the effort to improve our small country places.

Year by year our cities grow larger and more crowded, and this means more uncomfortable during the hot weather; and, as the wealth of their middle classes has likewise increased, their inhabitants more and more generally go

forth to the mountains or the seashore, and stay there for longer and longer periods. In our grandfathers' time even a rich New Yorker or Bostonian was content to take or send his family away from town for a month or six weeks. In our fathers' time this period had already doubled itself, and now even the sons and daughters of the citizen who does not consider himself rich expect their full three months of country life, while really rich people often include the greater part of the spring and the autumn as well as the whole of the summer in their term of rural residence.

These facts, of course, are not merely welcome signs of increasing material prosperity, but even more welcome proofs of a growing love for healthful occupations and pleasures. They may be confidently cited as a partial refutation of the charge that life in America is growing steadily more strenuous and nerve-exhausting—that the pursuit of the dollar is ever becoming more all-absorbing and all-sufficient; and also of the old charge that when an American stops working and wishes to recruit he makes his choice between working just as hard at some form of active play, or traveling with a speed which might daunt a commercial drummer or a Queen's messenger. For, be it remarked, while the family of the well-to-do business or professional man still spends much more time in the country than does its working head or his grown-up sons, yet these, too, get more of it than did their fathers or grandfathers.

Another cheerful and hopeful sign is that hotel life, once almost the only resource of the urban American in summer, now has a very powerful rival in cottage life. Indeed, hotel life has been quite killed out by this rival in many places, like Newport, for example, where it once flourished mightily, and everywhere through our mountain districts and along our seashores, myriads of summer cottages yearly spring up, scattered now in rather isolated ways and now gathered into compacter colonies, but always affording opportunities for rational and reposed family life.

Thinking upon these changes we may, indeed, be glad that, as has been said, the transient inhabitants of our rural regions devote more thought and pains than of yore to the aspect of their abodes, and the fact is all the more agreeable because thought and pains do not by any means invariably mean more money. Indeed, cheapness is studied now to a degree of which our fathers knew nothing, for the desire to own summer homes has spread far outside of the classes which, in their day, alone cherished such an aspiration. But our industrial and mechanical resources and our architectural ingenuity and skill have largely developed, hand in hand with the aesthetic instincts of our public; and thus beauty is not only more desired to-day than it was a generation ago, but is more easily to be purchased for moderate sums. The type of the American seashore cottage used to be a square clapboarded box, with the paint of which it once had boasted largely washed off, standing, perhaps, on stilts on a sandbank, surrounded by shaky-looking piazzas, devoid of vines or beautifying plantations of any sort, and surrounded by an expanse of rough sand, or stony pasture-land, or ragged beach grasses, and approached by a path or a drive which looked as though it had been made by cattle. But its type to-day is a shingled cottage, beautifully colored by the weather only, solid in aspect, attractive in form or showing that it has tried to be, more or less draped with vines and blossoming plants, and encircled by grounds which show the exercise of care, the effort after beauty and, often, the expenditure of a good deal of money.

But just here is the point to which we have especially wished to direct attention. The grounds of our summer cottages, and especially of those in seaboard districts, now often prove the expenditure of a great deal too much money. They prove that in gardening we have not yet advanced as far as we have in architecture. In gardening we less often reveal our sense of the primal facts that beauty must be devised by intelligence, not simply purchased with gold,

and that the keynote of beauty everywhere and always is fitness. We know that we may get a good summer cottage cheaply. We do not yet realize that we may cheaply keep or put its grounds into the best condition possible for them. We know that we must vary our architecture to suit different environments, but, as a rule, we have only one ideal for villa-grounds—the one that may be called the gardenesque ideal—the one that means doing as much upon a given expanse of soil as it is possible to do, and planting as many as possible of those trees and flowers and shrubs which are the gardener's, as distinct from Nature's, favorites; and in thus doing too much, and spending too much, we frequently ruin natural beauty, or eliminate the possibility of it, without achieving our own aim. It is time to learn that, while upon some sites the intelligent planter will try to bestow all the luxuriance and variety, all the finish and polish that he can imagine and can buy, upon others his intelligence will be most clearly shown by holding his hand and shutting his purse after a very little has been done, and by doing that little in accordance with the indications which Nature has given in regard to the special character of that particular site.

By an arrangement recently concluded between the President and Fellows of Harvard College and the city of Boston important additions have been made to the Arnold Arboretum. These include two parcels of land with an area of about twenty acres within the boundaries of the original Arboretum, but reserved by the city for its own uses when it was established; two pieces of land with an area of about three acres on the north-west border of the Arboretum, and purchased by the city last year; a piece of land, the property of Harvard College, south-west of the old Arboretum, with an area of sixty-seven and six-tenths acres; this consists of a high, rolling, grassy hill, the second highest land in the city of Boston. From the summit of this hill fine views are obtained; the wooded portions of the Arboretum lie at its base; to the south all the Blue Hill range is in view; the waters of Massachusetts Bay are seen to the south-east, and to the north and west a broken well-wooded country. With these additions the area of the Arboretum is two hundred and twenty-two and six-tenths acres. Two and a third miles of drives have been finished and planted, and under the new arrangement the city of Boston is to construct one and three-tenths miles of additional roads.

Among the scientific gardens in the United States and Europe, only the Royal Gardens at Kew, with an area of 251 acres, exceed the Arnold Arboretum in size, and it is probably safe to say that no other scientific garden of such an area is so accessible to the people of a great city or possesses such a diversified surface and such advantages in the way of natural woods. The Arboretum lies entirely within the limits of the city of Boston, and is not more than four miles from the centre of population, being easily reached by one line of railroad and by two lines of electric cars, while the parkway which unites the different parks of the City Park System, starting from the Public Garden, on Arlington Street, in the heart of the residential quarter of the city, skirting the town of Brookline and enclosing Jamaica Pond, forms its eastern boundary and connects it with Franklin Park beyond. By this parkway the distance from the Common to the Arboretum is six miles.

Plant-breeding at the Experiment Stations.

THE systematic origination and development of improved varieties of plants requires a thorough and comprehensive knowledge of varieties, plant-growth and heredity, and few fields of horticultural experiment have been productive of greater practical results. Before the introduction of the Wilson Strawberry, our markets were not fully supplied with this delicious fruit, not because the people could not appreciate its worth, nor because gardeners were unable or unwilling to grow it, but because

no variety had been found sufficiently productive to be generally profitable, or sufficiently firm to endure long carriage. The thousands of acres of vineyards in nearly all parts of our country are, perhaps, mainly the outgrowth of the Concord Grape. Apple-culture in Minnesota, Iowa and Wisconsin is at present waiting for the development of varieties that can endure the climatic conditions of those states, and be equal to those of more favored locations in quality; and persons best informed on the subject believe that these varieties are forthcoming.

If these propositions are true, plant-breeding, by which I mean the systematic production and development of improved varieties, is certainly one of the most important fields for work in our experiment stations. Yet, how little is being done in this line! How many of the new varieties that are introduced each year come from our experiment stations? The Ignotum Tomato, introduced by Professor Bailey, has become a standard variety, but Professor Bailey has never claimed that he originated this Tomato. Besides this, I do not recall a single variety of fruit or vegetable that has been disseminated from a state or government experiment station that has attained any prominence.

It has been said that Mr. Luther Burbank, of California; Mr. E. S. Carman, of New Jersey, and Mr. T. V. Munson, of Texas, have each of them done more for horticulture in the way of improving varieties than all of the experiment stations combined. It would seem that the trained horticulturists of our stations, with all the needed appliances and with help at their command, ought to be able to accomplish as good work in this field as private horticulturists, who must take the time from their own business and develop the varieties at their own expense. Our experiment stations should be sending out new varieties to these enthusiastic amateurs, and should keep them so busy with the work of testing that they would have no time to originate varieties. But at present the machine is working in the opposite direction. The amateurs are furnishing the varieties, and too many of our station horticulturists seem to think that they are doing their whole duty in gathering these together, planting them side by side, and publishing notes of their behavior as fit material for an experiment station bulletin.

I am aware that there is another side to this subject. I know by painful experience how difficult it is to find the time needed for this work, so many are the details that fall to our lot. I realize, too, that our stations are young yet, and that considerable time is required to develop a new variety. Nor am I unconscious of the substantial progress that is following experiment-station work in other departments of horticulture. Nevertheless, I have a deep-seated conviction that results of the first importance must come from plant-breeding and that our stations should devote more attention to this subject.

Experiment Station, Madison, Wis.

E. S. Goff.

Birds of the Arnold Arboretum.

ALTHOUGH the suburbs of Boston are peculiarly well fitted for the abode of a great variety of birds, the continual encroachment of urban conditions will eventually make such a place as the Arnold Arboretum a precious spot to the city bird-lover who is obliged to look near at hand for the enjoyment of his favorites. The Arboretum is well favored in its natural features as a home of birds, and the artificial plantations are of such a character as to invite the stay of many species that would naturally retire before the growth of a large city. As the surrounding country becomes more and more densely populated it will be interesting to see how many of the present feathered tenants will remain. It seems worth while, therefore, to put on record a statement of the present bird population of the place. The following lists, made from observations during the past few years, are intended to include only those species actually resident in the Arboretum during the summer or winter. No account is taken of the numerous migrants

that pass through during the spring and autumn, or of the irregular winter visitors, like the Pine Grosbeak, the two Crossbills, Redpoll and Siskin, which are occasionally abundant. The summer birds all nest within the boundaries except the Barn Swallow, a colony of which breeds on an adjoining estate in one of the few "Swallow-barns" yet left within the city limits, and uses the Arboretum as a constant feeding-ground. It will be seen that the lists include some of our most attractive birds of song or plumage. What an addition to any park is the presence of such birds as the Wood Thrush, Veery, Rose-breasted Grosbeak, Bobolink, Scarlet Tanager, Indigo Bird, Quail and Partridge. May they long delight us and our successors!

I.—SUMMER RESIDENTS.

<i>Actitis macularia</i>	Spotted Sandpiper.
<i>Colinus virginianus</i>	Bob-white.
<i>Bonasa umbellus</i>	Ruffed Grouse.
<i>Coccyzus americanus</i>	Yellow-billed Cuckoo.
<i>Coccyzus erythrophthalmus</i>	Black-billed Cuckoo.
<i>Dryobates pubescens</i>	Downy Woodpecker.
<i>Colaptes auratus</i>	Flicker.
<i>Chætura pelagica</i>	Chimney Swift.
<i>Trochilus colubris</i>	Ruby-throated Humming Bird.
<i>Tyrannus tyrannus</i>	Kingbird.
<i>Sayornis phœbe</i>	Phœbe.
<i>Contopus virens</i>	Wood Pewee.
<i>Empidonax minimus</i>	Least Flycatcher.
<i>Cyanocitta cristata</i>	Blue Jay.
<i>Corvus americanus</i>	Crow.
<i>Dolichonyx oryzivorus</i>	Bobolink.
<i>Molothrus ater</i>	Cowbird.
<i>Agelaius phœniceus</i>	Red-winged Blackbird.
<i>Icterus galbula</i>	Baltimore Oriole.
<i>Carpodacus purpureus</i>	Purple Finch.
<i>Spinus tristis</i>	Goldfinch.
<i>Pooecetes gramineus</i>	Vesper Sparrow.
<i>Spizella socialis</i>	Chipping Sparrow.
<i>Spizella pusilla</i>	Field Sparrow.
<i>Melospiza fasciata</i>	Song Sparrow.
<i>Pipilo erythrophthalmus</i>	Towhee.
<i>Habia ludoviciana</i>	Rose-breasted Grosbeak.
<i>Passerina cyanea</i>	Indigo Bunting.
<i>Piranga erythromelas</i>	Scarlet Tanager.
<i>Chelidon erythrogaster</i>	Barn Swallow.
<i>Ampelis cedrorum</i>	Cedar Waxwing.
<i>Vireo olivaceus</i>	Red-eyed Vireo.
<i>Vireo gilvus</i>	Warbling Vireo.
<i>Vireo flavifrons</i>	Yellow-throated Vireo.
<i>Mniotilla varia</i>	Black and White Warbler.
<i>Helminthophila chrysoptera</i>	Golden-winged Warbler.
<i>Dendroica aestiva</i>	Yellow Warbler.
<i>Dendroica pensylvanica</i>	Chestnut-sided Warbler.
<i>Dendroica virens</i>	Black-throated Green Warbler.
<i>Dendroica discolor</i>	Prairie Warbler.
<i>Seiurus aurocapillus</i>	Oven-bird.
<i>Geothlypis trichas</i>	Maryland Yellow-throat.
<i>Setophaga ruticilla</i>	Redstart.
<i>Galeoscoptes carolinensis</i>	Catbird.
<i>Harporhyncus rufus</i>	Brown Thrasher.
<i>Parus atricapillus</i>	Chickadee.
<i>Turdus mustelinus</i>	Wood Thrush.
<i>Turdus fuscescens</i>	Wilson's Thrush.
<i>Merula migratoria</i>	Robin.
<i>Sialia sialis</i>	Bluebird.

II.—WINTER RESIDENTS.

<i>Colinus virginianus</i>	Bob-white.
<i>Bonasa umbellus</i>	Ruffed Grouse.
<i>Buteo lineatus</i>	Red-shouldered Hawk.
<i>Dryobates pubescens</i>	Downy Woodpecker.
<i>Colaptes auratus</i>	Flicker.
<i>Cyanocitta cristata</i>	Blue Jay.
<i>Corvus americanus</i>	Crow.
<i>Spinus tristis</i>	Goldfinch.
<i>Melospiza fasciata</i>	Song Sparrow.
<i>Spizella monticola</i>	Tree Sparrow.
<i>Juncos hyemalis</i>	Snowbird.
<i>Lanius borealis</i>	Northern Shrike.
<i>Certhia familiaris americana</i>	Brown Creeper.
<i>Sitta carolinensis</i>	White-breasted Nuthatch.
<i>Parus atricapillus</i>	Chickadee.
<i>Regulus satrapa</i>	Golden-crowned Kinglet.

C. E. Faxon.

On the Tanning Properties of the Bark of Three North American Trees.

As is well known, the bark of *Quercus densiflora*, of California, is popularly considered the most valuable tanning material produced in the Pacific states of North America. This Oak is the only American representative of a peculiar group of trees which inhabit south-eastern Asia, and are intermediate in botanical characters between the true Oaks and the Chestnuts. There is another genus, *Castanopsis*, which is also intermediate between the Oaks and the Chestnuts, and also of south-eastern Asia, but, curiously enough, with a single representative in Oregon and California, *Castanopsis chrysophylla*, a very beautiful tree, which the Californians call the Gold-leaved Chestnut, from the bright golden scurf which covers the lower surface of the leaves. Some botanists treat *Castanopsis* as a section of *Castanea*, while others, like Dr. King, of Calcutta, who has made a special study of the genus, although finding no very good characters by which it can be distinguished from one of the Asiatic sections of *Quercus*, maintain the genus for purposes of convenience. The relationship of this tree to *Quercus densiflora* on one hand, and to the Chestnut on the other, suggested that its wood and bark might contain valuable tanning properties, and, at our suggestion, Professor Henry Trimble, the professor of analytical chemistry in the Philadelphia College of Pharmacy and the American authority on tannins, has made an examination of the bark and wood, as well as of the bark of *Quercus densiflora* and of the common eastern Hornbeam, *Ostrya Virginiana*, with the results which he has set forth in the following letter:

The following figures represent the results obtained by me on the wood and bark of *Castanopsis* and on the bark of *Quercus densiflora* and *Ostrya Virginiana*, the last collected in June near Philadelphia. As the sample of *Castanopsis* bark was quite "green" when received, I presume it was collected in the early part of June.

	Moisture.	Tannin, in absolutely dry sample.	Ash, in absolutely dry sample.
<i>Castanopsis</i> bark	42.72 per cent.	18.92 per cent.	3.70 per cent.
" wood	9.75 "	3.67 "	0.72 "
<i>Quercus densi-</i> } <i>flora</i> bark }	10.31 "	16.12 "	2.46 "
<i>Ostrya</i> bark	20.41 "	6.49 "	8.47 "

The purified tannins from the *Castanopsis* bark and from the bark of *Quercus densiflora* gave, on elementary analysis, the following results :

	<i>Castanopsis</i> .	<i>Quercus densiflora</i> .
Carbon, . . .	60.69 per cent.	60.71 per cent.
Hydrogen, . . .	4.95 "	5.21 "
Oxygen, . . .	34.36 "	34.08 "
	100.00	100.00

These results, when taken with the fact that they gave green precipitates with salts of iron and precipitates with bromine water, indicate that the tannins from *Castanopsis* bark and wood, from the bark of *Quercus densiflora* and from *Ostrya* bark are identical, and that they all belong to the Oak-bark group of tannins.

The *Ostrya* bark contains nearly enough tannin to make it valuable in the leather industry, and the barks of *Castanopsis* and of *Quercus densiflora* ought to be especially valuable, since there are very few barks that equal them in percentage of astringent principle. Of course, I do not know how abundantly the trees occur; you undoubtedly have that information.

College of Pharmacy, Philadelphia.

Henry Trimble.

Castanopsis, although it does not form forests in California, is not rare on the coast ranges of northern California, where it grows to its largest size, sometimes to the height of more than eighty feet, so that this tree may be expected to become a valuable factor in the tannin supply of the Pacific states.

The specimens of bark of *Castanopsis* and *Quercus densiflora* were obtained for Professor Trimble's analysis by Miss Alice Eastwood, the botanical curator of the

California Academy of Sciences. The wood of *Castanopsis*, analyzed, was from a tree cut in 1880 for the Forestry Division of the Tenth Census of the United States.

Foreign Correspondence.

Pelargoniums.

THIE Pelargonium fills as important a place in indoor gardening as is filled in the open-air garden by the Rose and Rhododendron. The analogy may be carried even further, the origin of the garden races of the three genera being similarly mixed. The many and beautiful varieties of Show, Fancy, Zonal and Ivy-leaved Pelargoniums now cultivated in every garden are the result of cross-breeding and selection extending over a period of something like one hundred years, and the work still goes on, although with much less vigor than formerly. New varieties are, however, added annually by such raisers as Messrs. Lemoine, Cannell, Pearson and Turner, and some idea of how much has been done in this country toward improving and multiplying the Pelargonium may be gathered from the fact that the Royal Horticultural Society awarded certificates to about seven hundred varieties in the period between 1860 and 1890. Twenty years ago these plants were much more in favor with the leading English horticulturists than they are now, while in the first quarter of the present century there were special exhibitions, special publications and fervid discussions in the horticultural periodicals, all devoted to the Pelargoniums, much as they are to the Chrysanthemum at the present time. But if Pelargoniums are not now in the first rank of fashion they have not lost ground, for they are just as important in the gardens of the million as they ever were, and I question if even the Rose is so universally grown and loved as the Pelargonium.

The history of the origin of the garden Pelargonium, so far as it is known, has been admirably summarized by Mr. Burbidge in his *Propagation and Improvement of Cultivated Plants*, pp. 319-331. Much information concerning the early sorts can also be obtained from Andrews' *Monograph of the Genus Geranium* (1805), which contains beautifully executed colored figures of the principal species, varieties and seedlings then in cultivation. That the crossing of the species one with the other had been in operation for some time even at that early period is shown by the following extract from Andrews, who writes of "the introduction of the African species within the last twenty years from the Cape of Good Hope, whose prolific character seems to know no bounds in the production of endless seminal varieties, which, Proteus-like, appear in ever-varying forms, and for which numerous variations we are indebted to the industrious bee, which conveys the pollen from one plant to another."

Sweet's *Geraniaceæ*, a work of five volumes, published 1820-30, containing 500 colored pictures, chiefly of Pelargoniums, nearly all of them of known or supposed hybrid origin, also contains much information as to the early history of the garden Pelargonium.

Of the 170 species of Pelargonium known only very few can be traced in the races now grown. These races are, roughly, four, the Zonal or bedding Geraniums, descended from *P. zonale* and probably *P. inquinans*; the Ivy-leaved Geraniums, the progeny of *P. peltatum* and *P. hederaefolium*; the Show Pelargonium, from *P. grandiflorum* and *P. cucullatum*, and the Fancy Pelargonium, the source of which is unknown. This quartette excludes the scented-leaved Pelargoniums, which can scarcely be said to be a garden race.

These four races are all quite distinct from each other, and, except in one instance, they have refused to interbreed, crosses between the Show and Zonal, or Show and Ivy-leaved sections being unknown. But we have crosses recorded between Zonal and Ivy-leaved sorts, although they were "nearly useless for cross-breeding purposes, as

they rarely produced seed or fertile pollen." The present wonderfully improved race of Ivy-leaved varieties is said to have had its origin in a chance seedling which made its appearance in a garden in Nice about twenty years ago, and which was secured by Monsieur Jean Sisley, a great French breeder of Pelargoniums, who thought that owing to its fertility it would prove valuable in the hands of a clever hybridizer.

Of course, all the varieties of Pelargonium are reproduced only by means of cuttings, their seeds being worthless except as a possible source of new varieties. But as the proportion of promising seedlings to worthless weeds is about one in ten thousand, the prospect of obtaining a good variety by this means is not hopeful. A large proportion of the varieties we grow are from bud-sports. So far in relation to Pelargoniums generally.

The beautiful Show and Fancy races of Pelargonium still have many fanciers among English horticulturists and still figure prominently at our plant exhibitions. The illustration recently published in GARDEN AND FOREST was from a photograph of a specimen exhibited at last year's Temple Show by Mr. Turner, of Slough, who has been famous as a raiser, grower and exhibitor of these plants for nearly fifty years, and who has no rival among those who grow them to-day. Some of Mr. Turner's specimens measure five feet in diameter and bear from one hundred to one hundred and fifty trusses of expanded flowers, which are usually at the best early in June. These specimens are grown in about four years from cuttings. All the flowers have to be "gummed" if the plants have far to travel, or if they have to stand in an exhibition hall lighted by gas. The largest pots used for these specimens do not exceed one foot in diameter; usually they are only nine inches. It is unnecessary here to go into the details of the cultivation of such specimens, but the general grower of Pelargoniums will, perhaps, be interested in knowing that the mixture Mr. Turner uses for his plants, both Show and Fancy, is one of good yellow loam, well-rotted stable manure, bone-dust, coarse sand and charcoal. The following is a selection of the best dozen varieties in each section, for which I am indebted to Mr. Turner:

Show varieties : Amethyst, Duke of Norfolk, Goldmine, Indian Yellow, Joe, Magnate, Maid of Honor, Martial, Mrs. Coombs, Magpie, Sister of Mercy, Spotted Gem. Fancy varieties : Ambassadress, East Lynne, Ellen Beck, Delicatum, Fanny Gair, Lady Carrington, Miss E. Little, Mrs. Hart, Mrs. Pope, Phyllis, Princess Teck, The Shah.

London.

W. Watson.

New or Little-known Plants.

Carpinus cordata.

THIS is one of the largest and, probably, the most beautiful of all the ten or twelve species of Hornbeam that are known. It belongs to that section of the genus (*Distegocarpus*) which differs from the Hornbeams of the United States and Europe by its deeply-furrowed and scaly bark and large winter-buds, by the long lanceolate acute scales of the flower aments, those of the stamineate inflorescence being distinctly stalked, and by the involucres of the fruit which resemble in color and texture those of *Ostrya* (the Hop Hornbeam), although, unlike those of that tree, they are not bladder-like nor closed, a large basal lobe or one or both margins of the ovate-acute involucre being infolded over the nut, while in our Hornbeam the involucre is halberd-shaped, usually three-lobed, and the nut is not covered by it.

Two of these peculiar Hornbeams, all that are now known, inhabit Japan; one of them, *Carpinus Carpinus*, the type of the genus *Distegocarpus* established by Siebold & Zuccarini, but subsequently reduced to *Carpinus*, has already been figured in this journal (vol. vi., f. 56). It is a tree forty or fifty feet in height, with a trunk sometimes eighteen inches in diameter, wide-spreading branches, dark green ovate-acute leaves, and clusters of fruit nearly

two inches long. This handsome tree, which is common at low elevations on the mountains of central Japan, has been in cultivation in the United States and Europe for

The second species (see illustration below, on this page) is less well known; it is a more northern tree, growing only on the main island of the Japanese group at high



Fig. 41.—*Carpinus cordata*.—See page 294.

1. A flowering branch, natural size. 2. A scale of a staminate ament with stamens, enlarged. 3. A scale of a pistillate ament with flowers, enlarged. 4. A fruiting branch, natural size. 5. An involucre of the fruit, with its lateral lobe folded over the nut, natural size. 6. An involucre of the fruit, the lateral lobe turned back to display the nut, natural size.

many years, and is perfectly hardy in the neighborhood of Boston, where there are now several shapely specimens large enough to produce flowers and fruit.

elevations, its true home being in the deciduous-leaved forests of central and northern Yezo, where it is very common and the only Hornbeam, and in Manchuria. On the

hills near Sapporo, in Yezo, it is a tree often forty feet in height, with a trunk eighteen inches in diameter. It is distinguished from *Carpinus Carpinus* by its larger winter-buds, which are nearly an inch long, by its thinner broadly ovate and deeply cordate leaves, which are often six or seven inches long and three or four inches wide, and by its much larger clusters of fruit, frequently five or six inches in length and an inch and a half in width.

The seeds of this beautiful and distinct tree, which is one of the most interesting inhabitants of the forests of north-eastern Asia, which I gathered in Yezo three years ago, unfortunately did not germinate, and it is not yet, I believe, introduced into our gardens. Judging by the fact that its associates in the Yezo forests are all hardy here, it may be expected to flourish in New England.

C. S. S.

Plant Notes.

HEMEROCALLIS MINOR.—This plant, which appears in gardens under several names, as *Hemerocallis Thunbergii*, *H. Sieboldii* and *H. graminea*, is a native of eastern Siberia and Japan. It is less stately, perhaps, than *H. flava*, which flowers early in June, but it is a very beautiful plant, with its long grass-like leaves and pale yellow fragrant flowers clustered on slender stems two feet or more tall. It has been in bloom now for the last two weeks and is one of the best and hardiest of summer-flowering herbaceous plants, alike suitable to decorate a border in the flower-garden or to naturalize in some half-wild woody glade. The flowers, when cut, last a long time and are well suited to arrange in large vases for the decoration of the house, like those of *H. flava*, to which we lately called attention in these notes (p. 264), where another early-flowering species, *H. Middendorfii*, by a typographical error appeared under the name of *H. Dumortieri*.

LONICERA RUPRECHTIANA.—Several of the so-called Bush Honeysuckles are not surpassed as hardy shrubs in northern gardens. They are very hardy; they grow to a large size, and with room in which to develop become shapely specimens; they flower profusely, and the fruit, which ripens in summer when there are few conspicuous fruits in the shrub garden, is very showy. There is a great bank of these plants in the Arnold Arboretum by the side of one of the drives, and just now, when the plants are covered with berries of all shades of red, scarlet and orange, it is very effective, as it was in May when the plants were in bloom. When covered with fruit, the Manchurian *Lonicera Ruprechtiana* is, perhaps, the most showy of these plants; it is a shrub eight or ten feet high and broad, with ashy gray branches, small pale blue-green leaves and scentless flowers, which quite cover the plant early in May, and are white when they unfold, but turn light yellow in fading. The fruit, which ripens rather later than that of the Tartarian Honeysuckles, and is now just beginning to color, is, when fully ripe, bright scarlet and almost transparent; it is so bitter that birds do not eat it, and it remains for a long time in perfection on the plant. *L. Ruprechtiana* is easily raised from seeds like the other Bush Honeysuckles, and it may be propagated by cuttings made in summer; it grows rapidly in good soil, requires no particular care, and will probably, like several other plants of this class, grow to a great age. For gardens in Canada and northern New England, on the shores of the great lakes, and in the northern plain region, it may be expected to be as hardy and satisfactory as the Tartarian Honeysuckles.

TAXUS CUSPIDATA.—The value of this Japanese Yew as an ornamental plant in the northern United States becomes more evident every year as it is better known and more generally planted. It is the only Yew of tree-like habit that is absolutely hardy in New England, and there is no reason why it should not be as generally used in this country as the European Yew, *Taxus baccata*, is in England. In the forests of Yezo, where it often grows to the height of sixty feet, *T. cuspidata* is a pyramidal tree with a tall, straight, thick trunk, covered with beautiful, bright red

bark; but in this country, where it has been growing for nearly twenty-five years, it has not yet lost its juvenile habit and appears as a dense, broad-based shapely bush, occasionally fifteen or twenty feet tall and broad. The foliage is slightly tinged with yellow, and the aspect of the plant is more cheerful than the European Yew, which grows much more slowly. In Japan the Yew is frequently planted in gardens and is often cut into fantastic shapes; it would make an excellent hedge-plant in this country, and is adapted, of course, to all sorts of topiary work.

ABIES CILICICA.—This, with the single exception of the blue form of *Abies concolor* from the Rocky Mountains of Colorado and New Mexico, is, perhaps, the most beautiful of the Silver Firs that are perfectly hardy and satisfactory in the north-eastern states. The Cilician Fir can be seen in great beauty in Mr. Hunnewell's pinetum at Wellesley, Massachusetts, where there are a number of specimens; in Dr. Hall's garden, near Bristol, Rhode Island, and in the Hoopes' pinetum at West Chester, Pennsylvania. Some of these trees are now forty feet high, and are compact sharp-pointed pyramids clothed to the ground with pale silvery foliage. Unfortunately, this fine tree is difficult to obtain, and still rare in collections. It does not thrive in western Europe, where the young shoots, which appear very early in the spring, like those of many other alpine trees, are killed by late frosts, and European nurserymen, therefore, do not propagate it. Seeds from wild trees are not easily procured. The trees cultivated in this country have not produced seeds yet, so that there is no way of increasing this Fir but by means of grafts, and grafted conifers are always unsatisfactory and usually short-lived. *A. Cilicica* inhabits the Taurus and Anti-Taurus Mountains, in the ancient Cilicia, and the Lebanon, and is said to form great forests at elevations between three thousand and seven thousand feet above the level of the sea. Good fresh seeds gathered at high elevations in its native forests would command good prices in this country, where comparatively few distinct Silver Firs can be satisfactorily grown.

Cultural Department.

Some July Flowers.

THE earliest *Gladiolus* to bloom this year, as well as last, is *G. Leichtlinii*, a small-flowered species, with bright scarlet flowers shading to crimson in the centre, and with yellow blotches on the lateral lower petals. It is pretty and interesting, but not showy. Some of the *Gandavensis* kinds are showing a little color, but will not be open for some days. They promise to be remarkably fine this year, growing with unusual vigor and displaying a deep and strong verdure. Those raised from seed last year will nearly all bloom this year, if I may judge from their present appearance, and I even expect three or four of this year's seedlings to do so. This strength of growth has become manifest only during the last three weeks, which have given us abundant rains, and copious dews on fair nights.

Several years ago I stated that *Gladiolus purpureo-auratus* proved perfectly hardy here, and had established itself in one of my mowing-fields. It still continues to come every year, but the scythe cuts it off before it can blossom. I also find *G. Saunderii* equally hardy. A year ago, while walking in a place I seldom visit because of its rough condition, it being too stony for cultivation, I came upon a plant of this species of a more robust growth than in my cultivated fields, and bearing several of its beautiful and showy flowers. Upon examining it I found the old stalks of two previous years. I left the plant, of course, and it is now in full growth, and will flower well. It has had no protection whatever in all the time it has been there; indeed, its presence there at all is a mystery to me.

A long row of many hundred spotted Callas, covered with their white spathes, is showy just now. Many of the blooms are past, and many are yet to open. Among them are many with two spathes together, the so-called double-flowered form. Such cases occur every year, and I saved some seed last year, and am trying to establish a race which will always produce two spathes. The yellow Calla, *Richardia Elliottiana*, seems to be of slow growth. My specimen is still alive and healthy, but I fear will not flower. A few days ago I visited Mr. Tailby's garden at Wellesley, and found his specimen with a beautiful golden-yellow spathe and with another stalk bearing a fine

head of seed. He told me that Mr. Veitch, who called a few weeks ago, said that no tuber of it had ever produced more than one flower in England. Mr. Tailby is a most persistent hybridist, and has a large stock of plants raised from *Richardia Little Gem*, fertilized with pollen of *R. Elliottiana*.

Hymenocallis calathinum is another feature in my garden at the present time. A week ago I counted the flower-stalks then in sight, and found seventy-seven; to-day I find that many others are showing, so that the entire number will probably reach one hundred and twenty. I have never seen the humming-birds visit these flowers, but many insects do, and have acquired the habit of making a hole near the base of the tube instead of creeping down into it. Some years ago I fertilized the late-flowering *H. Amancaes* with pollen of *H. calathinum*. I got three seeds, all of which grew and made bulbs, two of which were lost last winter; the third is yet alive, and may bloom some day.

Seedling Dahlias are now showing a few flowers, but a July Dahlia, especially a single one, is not good for much, and I cut them off as fast as they open. Not until August will they show their true character.

Canton, Mass.

W. E. Endicott.

Hardy Perennials.

THE tallest species of the Globe Thistle is *Echinops comutatus*, from Austria, which attains a height of seven feet, branching from about two feet above the ground. Though a much more stately plant than *E. Ritro*, it has not so striking a flower. The heads are nearly white and about two inches in diameter. It seems to attract more honeybees at this time than any other flower, for the heads are covered with these little workers most of the day.

Among the Campanulas now in flower, the *C. latifolia* is as attractive as any. It is a native of Great Britain, attains a height of two feet in good soil, bearing several white or blue flowers two and a half inches long. It is a trifle later in blooming than the Peach-leaved Campanula, *C. persicaefolia*, which, though not entirely past bloom, has been in flower for more than a month. Both species have two colors, white and blue, which, when growing together, are quite pretty. They are of easy culture and quite hardy.

Morina (elegans) longifolia, a native of Nepaul, attains a height of two feet or more. Before flowering it so closely resembles a Thistle that the workmen are inclined to pull it for a weed. It belongs to the natural order of Dipsaceæ. The flowers are crowded in whorls in the axils of the leaves, and are nearly white when first appearing, but change with age to a delicate pink and finally to crimson. It is a plant that requires more time to attain the flowering stage than most perennials; it took two years here. It is apparently perfectly hardy, but likes a little shade.

Gentiana cruciata needs more moisture than most common garden-soil affords. On this account it may not always succeed. When the roots can always find moisture it is an easy plant to grow. The pale blue flowers are crowded in the axils and are also terminal. I like much better to grow the Wind-flowered Gentian of Great Britain, *G. pneumonanthe*, because it seems to do well in ordinary soil and the flowers are a much deeper blue.

Gentiana Thibetica is also blooming at the same season, but the nearly white flowers are less attractive than most Gentians. This, however, is compensated in the finer foliage, which is the best I have seen in a Gentian. The flowers open only in the sunshine. In cloudy weather or late in the afternoon they close.

The Tartarian Sea Lavender, *Statice Tatarica*, which blooms about this time, is a pretty species, and quite hardy so far as I can see. It is, when in flower, about a foot high. The rigid, branching, diffusely spreading stem is covered with pale red or nearly white flowers. Its foliage is all at the base of the stem, close to the ground. With me it did not bloom until the second year from seed.

Charlotte, Vt.

F. H. Horsford.

Fancy Caladiums.

TO the commercial florist these plants are of little service, but in private gardens they are useful for the decoration of the greenhouse during the summer months, when they are apt to be left somewhat bare on account of the removal of such plants as Palms, etc. They occupy but little room during the spring when the greenhouse space is often taxed to the utmost. Sometimes they are started early and forced for Easter decoration, but only a few of the hardier varieties are suited for this purpose, and the practice is by no means general. One of the best for this use is the old *Argyrites*. Prob-

ably the best time for starting the general stock is in March, if a temperature of sixty to sixty-five degrees can be maintained, but if not they had better be left dormant a month later. A general custom is to place them first in sphagnum moss and pot them on after they have started a little, but we find they do equally well and are less troublesome when placed at once in small pots in a compost of two parts leaf-mold and one part each of sand and sod-earth. Should any of the tubers show signs of rotting, a little powdered charcoal should be rubbed on the infected parts. They start best in a brisk bottom-heat, and as they root quickly require frequent shifting, but large shifts must always be avoided. The potting compost should be light and porous, moderately enriched with well-rotted manure. They should be shaded from strong sunlight and syringed daily in bright weather. Toward the end of September, when the foliage begins to show signs of dying down, water should be gradually withheld, and when thoroughly dried out the tubers may be shaken out and stored in dry sand and set in a dry place, where the temperature will not fall below fifty-five degrees.

The varieties are so numerous that any attempt to describe or enumerate them is useless, and new varieties are constantly being added. The principal aim of the raisers of these new varieties appears to be fineness of texture, which is in most cases accompanied by delicacy of constitution, and this makes the newer varieties decidedly harder to handle than the old bright-colored and more robust ones. Attempts have been made to use some of the hardier varieties of Fancy Caladiums for bedding out, but they have never proved a success.

Tarrytown, N. Y.

William Scott.

Papaver bracteatum.—I remember reading some time since a controversy as to whether the dark form of the Oriental Poppy was a mere seed variation or a well-marked species. It was so long ago that I forget the decision, but it has recurred to me of recent years when seeing them growing together in the garden. I decided to save seed and see whether there was any tendency to reversion to the common scarlet varieties among the plants raised. It has been the impression among growers that the peculiarity of having bracts just under the flowers was nothing to be guided by, that the rich dark color was not constant, that the plant itself could only be propagated by its own roots, and that seedlings raised therefrom would revert to the common *Papaver orientale*. There is, however, a decided difference in the habit of the two plants, and they can easily be distinguished when not in bloom. *P. bracteatum* has foliage that is much more rigid and aculeolate than *P. orientale*, while the flower-stems are perfectly rigid even when in bloom, so that apart from the color there seem to be good grounds to suppose that it is something more than a mere seed variation, or even selection. The results here have emphasized this opinion, for out of a large number of *P. bracteatum* raised from seed saved without any special protection against insect agency, and growing side by side with the other variety, not one has shown any tendency to revert, but all are true dark-flowered *P. bracteatum*. *P. orientale* does vary a great deal from seed; of the many in the garden here no two are alike, some having four petals and some more, as many as eight, while the spots at the base of the petals are eliminated in some cases altogether, and vary greatly in others. Of the two, this variety has proved to be much less constant than *P. bracteatum*. It is not safe to assume which is the species, and the authorities differ. *P. orientale* was introduced some time prior to *P. bracteatum*; hence the former is generally regarded as the species.

Dipladenias.—These have been noted before as among the finest of summer-flowering climbers for the greenhouse, and they are now at their best, blooming with great freedom in full sunshine. It is not often that seeds are produced under cultivation, but a plant last season matured a fine seed-pod here, from which we have now some three dozen young plants growing rapidly, and we hope to bloom them next year. There is a wonderful variation even now in the young plants; no two seem to be alike in foliage, and either the shape or tint is different in most of them. We hope to get some good varieties from these. The seed parent was *Dipladenia profusa*, crossed with pollen of *D. Brearleyana*. Judging from present appearances, we shall get all the forms known in gardens from this lot of plants. *Dipladenias* are natives of Brazil. There are but two that are pink and regarded as species. All the others, more than a dozen in number, are of garden origin. The great value of these plants lies in the fact that flowers are produced from the same stems for months in succession. We have picked flowers in June, and as late as October from the

same stem, and this free-flowering habit makes them desirable where a brilliant climber for the greenhouse is required. They will stand well in winter in a temperature of fifty degrees, and require far less heat than was generally supposed necessary by the older cultivators. This may account for the unpopularity of the genus at the present time. We grow them in Fern-root alone. Loamy soil is liable to become sour and inert, and the plants speedily die when this is the case.

South Lancaster, Mass.

E. O. O.

The Forest.

The Need of Forest Schools in America.

THE extract which follows is taken from a paper read before the New York farmers by Mr. Gifford Pinchot, of this city :

Since the appointment of the first State Forest Commission in 1884 the Adirondacks have attracted a steadily increasing share of public attention. The interest of the people in the preservation of the state forest-lands has found expression in various legislative enactments, the last of which is a rather curious commentary on those which have preceded it. I refer to the recent constitutional amendment which prohibits the lease, sale or exchange of state forest-lands, and the sale, removal or destruction of the timber. Translated into terms of the situation, the people of New York, through their enthusiastic support of this amendment, may be imagined to speak somewhat as follows: "For ten years we have been trying to provide suitable protection and management for the state forest-preserves. At the end of that time we find ourselves reduced to the conclusion that the very best thing we can do is to give up all hope of a sound and profitable management, and simply content ourselves with putting it out of the power of the guardians of the forest to do it any harm." It is as though a man were to let his valuable farm lie fallow because he had not sufficient confidence in his own wisdom, ability and honesty to do anything else.

In view of the attempt made last March by the Forest Commission to turn over many thousand acres of the state lands to the lumbermen, under restrictions which practically interfered very little, or not at all, with their usual methods, I am not sure how much the people of the state were to be criticised for the position they took. The trouble was very much more deeply seated. Like so much of the difficulty which has beset government in this state, the cause lay in the attempt to get something done by the appointment of men who did not know how to do it. And in this case the situation seems to have been aggravated by the fact that the appointer was generally as little enlightened as the appointee. In a word, widespread ignorance of the meaning and object of forestry has been the keynote of the attempt of the Empire State to do something for its forests. The natural result has followed, and the state has made confession of its inability in the weightiest document which it is in its power to frame.

The situation may be summed up in this way: New York state owns a great body of forest-land whose preservation is of enormous value to its interests in more ways than I can stop to mention. This property, whose very existence is a blessing, is producing year by year a vast amount of most valuable material, the removal and utilization of which under regular forest-management would in no sense impair or even jeopardize the passive usefulness of the forest. Let me repeat this statement. Systematic forest-management on the state lands in the Adirondacks neither involves nor implies any reduction of the good influences of the forest in its relation to any of the vital interests of the state which depend upon it. On the contrary, what it does mean is greater safety, better protection and a more certain usefulness, and all these things obtained not merely without cost to the state, but with a growing revenue thrown in. If these things are so, it becomes natural to ask why advantage of them has not been taken. The answer has already been given. As a community we do not know what forestry is able to do, nor do we even realize the subject-matter with which it deals.

If I say that forestry has nothing whatsoever to do with the planting of road-side trees, that parks and gardens are foreign to its nature, that it has no connection with the decoration of country places, that scenery is altogether outside of its province, and that it is no more possible to learn forestry in an arboretum than to learn surgery in a drug store, I am making a conservative statement with which every forester will agree. Forestry deals exclusively with forests—a fact which will bear a good deal more publicity than has been accorded to it hitherto. It is connected with arboriculture and

landscape art only from the fact that it employs to a certain extent the same raw material, if I may use such a figure, but applies it to a wholly different purpose. That the subjects overlap at certain points is therefore true, but so do carpentry and the manufacture of wood-pulp paper, yet there is no confusion between them. That wise forest-management secures the natural beauty of a region devoted to it is a fortunate accident, but none the less an accident, pure and simple. The purpose of forestry is in a totally different sphere. Forestry seeks to discover and apply the principles in accordance with which forests are best managed, and it has to do with trees only as they stand, or are to stand, together on some large area whose principal crop is trees, and so form part of a forest. The objects of forestry are twofold, because there are two great classes of services which the forest yields to man. On the one hand it has a vital bearing on the water-supply and the prevention of torrents, and an undetermined influence upon the rainfall and climate, and on the other it yields a product which has been so far, and seems likely to remain, indispensable to the progress of civilization. This product it is the province of forest-management to harvest in such a way as to insure a second, and usually a greater, crop of at least equally valuable material. Except in rare instances, to do this is the surest way to secure the preservation of the indirect influences of the forest as they regard water and climate. The safety of the forest can ultimately rest on no other foundation than forest-management, for in no other way can it be made to yield its full service to the needs of men.

If we set what is now over against what is easily possible, we find on one side the indirect usefulness of the forest, in so far as the state lands are concerned, more or less perfectly attained at the price of a large annual appropriation. On the other is equal, or probably greater, security, and a net revenue. The difference between these two things lies in two words—knowing how. Knowing how in forestry is best learned at a forest school, and next to an enlightened public opinion and a scientific administration of the state lands, a forest school is the first need of forestry in New York. Personally, I believe that we must have the school before the wise public opinion, and before anything can be done in the Adirondacks, unless by private owners of woodlands. For, in the first place, the repeal of the constitutional amendment on forestry must be the opening move, and nothing but the broadest diffusion of a right conception of forestry will educate the people to that point. Secondly, administration presupposes men trained for the purpose, and such men are not available at present in anything like the numbers needed. Thirdly, the lumber companies which own large tracts in the North Woods are beginning to think seriously of the future, and men who could advise and assist them would be able to render conspicuous service to the commonwealth. This becomes apparent when we consider that of the whole Adirondack region the state owns less than a quarter. Whether such a school should be a state institution or a part of one of the great universities, and where it should be located, are matters which do not come within my subject to-night. The one thing I want to do is to set before you the present failure of the state in forest-matters, the reason for it, and one of the remedies. The other is the training of the public judgment through constant agitation. Both together are likely to be all too slow in reaching their end. But, whichever is used, it is education which is needed.

Correspondence.

Strawberries in Wisconsin.

To the Editor of GARDEN AND FOREST :

Sir,—One of your correspondents (see p. 257) speaks very highly of Michel's Early, Gandy and Parker Earle. This shows how differently plants behave in different localities. With us, Michel gives a few early berries, but is hardly any earlier than Van Deman, Rio or Warfield, and it does not bear enough fruit to pay for picking or planting. Gandy is late in beginning to ripen fruit, but does not continue so long as Warfield; it is a very fine berry, but does not yield freely enough. Parker Earle bears too much, unless on very rich soil, well mulched and well watered; I know of no better late berry for hill or narrow row culture. It does not make plants enough for matted rows; it is perfect in blossom and will pay with above treatment.

Soil and location are very important factors in Strawberry culture, but frosts and drought upset the best laid plans. No Strawberry will stand such frosts and drought as we have had this year and give a good crop. The best of fifty kinds fruit-

ing here in matted rows, after the severe weather such as we have never known before, of perfect flowering plants, are Lovett, Splendid, Enhance and Parker Earle; and of pistillate plants, Haverland, Warfield, Crescent and Bubach. These recovered best of any after the frosts, and if we could have had plenty of rain would have yielded perhaps half a crop.

Of the thirty-six best kinds planted in 1894 and kept in hills of five plants each, each plant being allowed to make only four runners, after three icy mornings in May and one heavy frost on May 27th, which did more damage than the colder nights, Sadie and Swindle, both pistillate plants, gave more than a quart to the hill. Neither of these varieties is profitable in matted rows. Warfield came next, and Gandy was behind twenty others.

Janesville, Wis.

George J. Kellogg.

Poison Ivy.

To the Editor of GARDEN AND FOREST:

Sir,—That the poisonous principle of *Rhus Toxicodendron* resides in the bark as well as in the leaves is proved by the fact that men who have to deal with logs and lumber suffer from the poison when they work in the woods in winter. My father has been severely poisoned by handling logs in the mill-yard with dry vines attached after they had been cut several weeks. The volatile character of the poisoning is proved by the well-known fact that susceptible persons are affected by passing to the leeward side of this *Rhus*. A neighbor of mine undertook to kill out some of the plants by pouring boiling water over them, and the vapors arising carried a sufficient infusion of the poison to produce a very serious case of poisoning. A workman in our garden, whenever he has occasion to meddle with the Ivy, always pulls one of the small leaves and eats a piece of it, asserting that the workmen on the railway along whose embankments the plant abounds always do this as a preventive measure, and with success.

S. F. Goodrich.

Common Plants.

To the Editor of GARDEN AND FOREST:

Sir,—The Mullein in this country is such a disagreeable evidence of bad husbandry that no one would think of planting it for beauty or ornament. In England it is not so universally considered a pestilential weed, and is cultivated for decorative effect. A well-grown specimen is really a magnificent plant, and a bed of them in the Kew Gardens is much admired. Their great velvety gray-green leaves and soft yellow blossoms were a revelation to me, though I had been familiar with them all my life in the pasture-fields at home. Germans call the plant the Kaiser-kerze, the Emperor's taper, and a pretty and appropriate name it is.

At a church festival a few years ago the ornamental value of one of our commonest wild flowers was shown. One end of the large hall was shut in by a rustic fence elaborately decorated with vines, Roses and a mass of creamy-white flowers that were wonderfully dainty in their effect. On the tables inside were offered for sale bouquets of many kinds of rare flowers, and conspicuous among them by its delicate loveliness were cymes of the same creamy-white blossoms. "What do you call them?" asked a gentleman, lifting an artistically arranged cluster from a vase of sparkling glass. "*Samibucus Canadensis*," answered the young girl in charge, with a faint, mischievous smile dimpling the corners of her mouth; "named from an ancient musical instrument that was made from the wood." And Elder blossoms they were, fragile and sweet as the choicest exotics there.

A plant in a costly jardinière in a luxurious dining-room was the admiration of all who saw it. The leaves were a rich green, with finely cut and curled edges, and it was generally supposed to be some rare Fern. Its owner, when asked its name, called it *Pastinaca sativa*. I caught a twinkle in her eye one day. My suspicions were aroused. I examined it more closely and discovered it to be Parsley—just a fine, graceful, well-cared-for bunch of Parsley, such as is grown in every kitchen-garden in the land.

In our search after beautiful vines we have overlooked one of the choicest ones of native growth. Our English cousins are more discerning, and in many places in that snug little island may be seen *Vitis labrusca*, our northern Fox-grape. Any one who has seen it trained over an arbor, or spreading its thrifty and abundant foliage over rough rockeries and masses of roots, will not soon forget the impression it gives of wild grace and beauty. It would be difficult to find its equal; yet how few appreciate it! It seems as if nothing short

of a celestial vision, such as Peter had, will open our eyes to the beauty of the common things about us.

Emlenton, Pa.

M.

Southern Pines (North Carolina) Experimental Farm.

To the Editor of GARDEN AND FOREST:

Sir,—The establishment recently of an experimental farm at Southern Pines is a matter of real importance to the fruit-growers of the long-leaf Pine district.

There are hundreds of thousands of acres in the south on which all the timber has been destroyed by the turpentine workers, lumbermen and fires, and which are now great desolate wastes. The sandy soil is for the most part the favorite habitat of the long-leaf Pine and has been regarded as unfit for agricultural purposes. No wonder people in the south have argued that the land was not good for raising crops of Cotton or Corn. And so nothing was done to improve the soil, and many thousand acres in the long-leaf Pine region were, and are to-day, practically abandoned.

Such was the condition of the country, in Moore County, about Southern Pines, when Dr. Von Herff, of New York, began buying large tracts of land. He early saw the necessity of making experiments to determine the requirements of this sandy soil, especially in the way of fertilizers best suited for fruit-growing. It is entirely through his efforts that the experimental farm was established at Southern Pines.

The farm is under the auspices of the State Horticultural Society in co-operation with the North Carolina Experiment Station. Dr. H. B. Battle, of the Station, is interested in the success of the experiments now under way, and has freely given his time and attention to various details. In this he has been assisted by Professor W. F. Massey and Professor Irby, both of the Agricultural College, Raleigh.

The chief object of the managers of the farm will be to find out the requirements of the soil, especially for fruit-growing. The problem is to determine the proper fertilizers to be used. Many analyses of the soils all through the south show that they are deficient largely in potash. Hence, experiments are now being made to measure the need of potash in connection with nitrogen and phosphoric acid.

A number of fruit-crops have been planted on the farm, which comprises about sixty acres. The area for each crop is divided into plots of equal size—"experimental plots," as they are called. These are all treated with different kinds and amounts of fertilizers. The results obtained from all the plots will be collected and studied separately in order that correct conclusions can be drawn.

New York.

L. J. Vance.

Recent Publications.

We have received the first part of *The Flowering Plants and Ferns of New South Wales, with special reference to their economic value*, by J. H. Maiden, Esq., of the Technological Museum, Sydney, assisted by W. S. Campbell. This work is intended to make known the principal flowering plants and Ferns of the colony, and each part is to contain figures and descriptions of two forest-trees of economic value and of two shrubs or smaller plants, selected on account of their beauty or scientific interest. In the first number are well-executed colored plates, with sufficient analytical detail, of *Telopea speciosissima*, the Waratah, a stout, erect, glabrous shrub, with crimson flowers in dense ovoid or globular heads about three inches in diameter. The name *Telopea*, from the Greek *telopos* (perceived from afar), was given to this plant on account of the conspicuous crimson flowers, and Mr. Maiden tells us it has come to be recognized as the national flower of New South Wales.

The second plant that is figured is *Eucalyptus corymbosa*, the Bloodwood, a tree which owes its popular name to the fact that it exudes an abundance of resinous gum, which has, when fresh, the appearance of blood. It is a fine timber tree, attaining the height of from one hundred to one hundred and twenty feet, with a trunk from two to four feet in diameter, producing a dark red-purple durable inflammable timber, which is difficult to saw on account of the large quantity of gum that it contains.

The other plants figured are *Actinotus Helianthi*, the Flannel Flower, an erect perennial umbelliferous plant, curiously like a Composite in general appearance, with

showy pale petaloid bracts forming a star-like involucrum; and *Acacia glaucescens*, the coast Myall, a handsome species with dark, exceedingly hard wood, used in turnery, for mallets and other small articles.

The form of this book, as displayed in the first instalment, is good; the botanical descriptions, which are clear, concise, and not too technical, are enriched with systematically arranged historical, geographical, economic and cultural notes. In California especially, where nearly all Australian plants flourish apparently as well as in their native land, this work should prove especially serviceable to cultivators of exotic plants. It is published by the Forest Branch of the Department of Mines and Agriculture of New South Wales, at Sydney, the price being 2s. 6d. for each part to subscribers, and 3s. 6d. for single parts.

Notes.

The Peach-blossom has been selected by a vote of the school-children of Delaware as the floral emblem of that state.

The Nomenclature Committee of the Society of American Florists desires information as to any cases of misnaming or confusion of names in American decorative plants, as well as of any other matters coming within the line of work of the committee. Communications should be addressed to the chairman of the committee, Professor William Trelease, St. Louis, Missouri.

In the Bulletin of the United States National Museum, No. 39, Dr. Frederick D. Coville, botanist of the Department of Agriculture, has recently printed some clear directions for collecting specimens of plants and information illustrating their aboriginal uses, which will be found useful to both travelers and settlers who have an opportunity to observe the habits of any of the tribes of American Indians.

An old legend traces the origin of the Thistle as the emblem of the Scottish kingdom to the far-away time when the Danes were invading the country. On a dark night, runs the story, as they were advancing to attack an encampment of Scots, one of them trod on a Thistle, and the thoughtless exclamation which followed awakened the slumberers, who, springing to arms, defeated their assailants. In gratitude for this deliverance the flower of the Thistle was adopted as the national emblem.

At a recent sale in Paris of the library of the architect Destailleur a copy of the first edition of *Le Traité de Jardinage selon les Raisons de la Nature et de l'Art*, by Jacques Boyceau de la Barauderie, realized two thousand francs. This exceedingly rare work, which contains a number of carefully engraved plates of parterres, and of which only a few copies are now known to exist, is said by Monsieur André, in a recent issue of the *Revue Horticole*, to give the only faithful account of the gardens of the time of Louis XIII. A copy of *Wilton Garden*, published in 1640, was sold at the same sale for six hundred francs, and *Le Fidèle Jardinier en Différentes Sortes de Parterres*, by Pierre Betin, published in Paris in 1636, brought five hundred and eighty-two francs.

On the banks of the Brandywine, near Wilmington, Delaware, gunpowder works were established by a Frenchman, Eleuthère-Irénée du Pont de Nemours, the American founder of the distinguished Dupont family of Delaware, who came to this country in 1799. They are still in existence and are carried on by the grandchildren of their founder. But his name has a further interest as that of the planter who is believed to have first introduced the European Chestnut into the United States. He was deeply interested in horticulture and agriculture, and in 1805 planted specimens of the French Chestnut on his Delaware estate. The original trees are no longer in existence, but their progeny are widely scattered through the middle states, where several named varieties, descendants of the Du Pont Chestnut, are recognized.

Professor F. L. Hanley, in the First Annual Report of the Maine Forestry Commission, argues, from an examination of the statistics of the lumber produced on the Penobscot River, that the lumber industry is waning in the Pine-tree State. In 1856 the cut on that river was about 180,000,000 feet; in 1866 this was increased to 237,000,000 feet, and in 1872, when it reached its maximum, to 246,000,000 feet. Since then it has gradually fallen, and in 1887 the yield was only about 150,000,-

000 feet. The great falling off has been in pine—from 101,000,000 feet in 1856 to 29,000,000 feet in 1887. To secure the present supply, too, it is necessary to cut every year nearer the head-waters of the streams and to cut smaller and poorer trees, which a few years ago would have been passed by as unmarketable. Logs which are now driven down the Penobscot do not contain an average of much over a hundred feet, board measure, of lumber, while twenty years ago they are said to have contained several hundred feet. The annual supply, too, is now largely cut from second, and even third, growth, and it is said that the time is approaching when the entire Maine lumber crop will come from forests that have been cut over. There are only limited areas, it appears, in the state where Pine follows Pine, and the second growth is inferior to the first.

All America is interested in the eventual fate of Jackson Park, in Chicago, and the latest accounts of the work that is to be done there sound very promising. According to a letter recently published in the *American Architect and Building News*, \$80,000 has been handed over to the Board of South Park as the price received from the sale of the wrecked Fair buildings, and this money they will at once lay out in local improvements. The plan for them, which was prepared some time ago by Mr. Olmsted, will be followed as closely as possible. At the northern end of the park, in the neighborhood of the Fine Arts Building, which has been preserved under the name of the Field Museum, the landscape arrangements will be of a somewhat formal character, as suited to the environment of so large and so classic a structure. But a little farther off the drives curve in a more informal way around the lagoon and Wooded Island, until they sweep gracefully up to the top of the little eminence which, near the southerly end of the park, overlooks the Convent of La Rabida. The great golden statue of Liberty still stands, and where the peristyle formerly stood, between it and Lake Michigan, there will be a beautiful drive along the water's edge, following the lines of the shore from the long pier behind the statue back to the northern extremity of the pleasure-ground. Greenhouses are to be erected near the Field Museum, and here, we are told, "floral displays" will be concentrated, expressing a higher grade of taste, one must hope, than those which have hitherto existed in other places in the parks of Chicago. Certain tracts of land near where the great Manufacturers' Building stood will be prepared for tennis, baseball and other sports.

Writers in the Boston papers are making their annual protests against the larvæ of Tussock moths, *Orgyia leucostigma*, which for many years have destroyed the summer foliage of the trees on the Common. This year the caterpillars appear to be unusually numerous, not only on the Common, but on the trees in several streets on Beacon Hill, notably on Chestnut and Mount Vernon streets; and the secretary of the State Board of Agriculture has even addressed a letter to the Mayor of the city on the subject, warning him of the danger of allowing these insects to multiply, and pointed out the simple methods needed to exterminate, or, at least, to greatly check their ravages. Few insects are so easily destroyed as the Tussock moth. The wingless female lays her eggs on the outside of the cocoon from which she has just emerged, so that by destroying the cocoons which the caterpillars spin on the trunks and branches of trees and on the neighboring fences and walls the next year's brood of larvæ is killed. The cocoons may be easily distinguished during the winter on the trunks and bare branches, and it is not a difficult or expensive matter to pick them by hand or rub them off with stiff brushes. The city forester, discouraged, no doubt, by his attempts made several years ago to protect the trees on the Common from insects by injecting some mysterious compound into holes bored into the trunks, which have now developed in some cases into large and dangerous wounds, seems perfectly helpless in the matter, pleading the want of sufficient funds to enable him to clean the trees. More than \$80,000 are expended annually under his sole direction, however, in maintaining the small public grounds of Boston. Some of this money is spent in keeping up a large greenhouse establishment to protect tropical plants in winter, which, as they are used in Boston, are an injury to the appearance of the city. What must be a considerable part of it goes into the floral emblems and other horticultural abominations which disfigure the Public Garden. The cultivated and intelligent Bostonians deplore the extravagance of their garden, and the example of bad taste which it sets, but it is generally praised by the press, and every year it grows more vulgar and less what such a garden should be. A small part of the money spent in making the Public Garden ugly would, if properly used, rid every tree in the city of insects.

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLE:—The Tree Yuccas in the United States. (With figure.)
Japanese Vegetation in California.....	Charles Howard Shinn
Oil of Birch.....	Professor Henry Trumbull
Notes from a Botanic Garden.—I.....	Professor W. J. Beal
FOREIGN CORRESPONDENCE:—London Letter.....	W. Watson
PLANT NOTES.....
CULTURAL DEPARTMENT:—Air Drainage in Orchards.....	T. H. Hopkins, M.D.
Cupheas.....	R. C. Moore
The Flower Garden.....	W. N. Osgood
The Rock Garden.....	T. D. Hatfield
The Tussock Moth, <i>Orgyia leucostigma</i>	W. E. B. Southwick
CORRESPONDENCE:—The Good Work of an Improvement Association at Narragansett Pier.....	M. G. Van Rensselaer
RECENT PUBLICATIONS.....
NOTES.....
ILLUSTRATION:— <i>Yucca macrocarpa</i> , Fig. 42.

The Tree Yuccas in the United States.

PERSONS, whose only acquaintance with Yuccas is with the little Bear Grass, or *Yucca filifera*, so common in northern gardens, whether they are old-fashioned or new-fashioned, will not easily forget the first sight of a tree Yucca growing on its native desert. The Yucca is an exclusively New World plant, and is distributed from the shores of Virginia and the plains of Colorado to Central America. There are probably sixteen or eighteen species of these plants, although many more have been described—often in Europe from cultivated individuals. Yuccas are difficult plants for the botanist to manage, owing to their size and nature; and it is almost impossible to preserve in herbaria specimens that adequately illustrate the species. Individuals of the same species vary widely in the length and width of their leaves and in the size of their flowers and fruit, so that the seedlings of one plant, scattered through the gardens of different countries, might be given different names by botanists familiar only with a few individuals. The difficulty of knowing these plants, too, is much increased by the fact that Yuccas very rarely produce fruit in cultivation, insects which only live in the regions inhabited by the different species being essential to secure the fertilization of the flowers. It is not surprising, therefore, that there is hardly a group of garden-plants about which there is so much confusion in books, and this confusion will never be cleared up until the different species are studied extensively in the field, and then gathered together in some California or Mexican garden where their development under normal conditions can be patiently watched.

The territory of the United States is inhabited by twelve or thirteen species. Of the distribution and character of these species much, fortunately, is already known from the careful studies of Engelmann and Trelease, although there is still plenty to learn about them. Seven of the species, ranging from the shores of the south Atlantic states, along the southern boundary of the United States to the coast of southern California, grow up from the ground with single stems, which usually branches in old age, and, therefore, must be considered trees—but strange-looking trees—with long rigid dagger or bayonet-like leaves and enor-

mous clusters of creamy-white flowers, and with very little in common with the Birches, Pines and Willows of the northern forest.

The distribution, at least, of these seven tree Yuccas of the United States is at last fairly well known. Beginning in the east, *Yucca aloifolia* occupies a narrow coast belt from the neighborhood of the mouth of the Cape Fear River, in North Carolina, to Louisiana, growing in sandy Pine-barrens, and often on the sandy beaches of bays and salt-water lagoons. It is a sparingly branched tree, sometimes twenty feet high, growing with a single stem or with a cluster of spreading stems, and short dark green narrow, rigid leaves. This is the most common of all the tree Yuccas in cultivation, and is found under a number of names in gardens all over the world. It is to this species that the commonly cultivated variegated Yuccas belong.

Traveling from east to west, the next species encountered is *Yucca Treculiana*, the Spanish Dagger or Spanish Bayonet of western Texas, a tree sometimes thirty feet in height, with a comparatively slender trunk, numerous wide-spreading branches and long, sword-like, concave, blue-green leaves. This plant is common in south-eastern Texas, forming near the mouth of the Rio Grande, just back of the sand-dunes of the coast, straggling stunted forests, and further inland low impenetrable thickets. Southward it ranges over the plains of north-eastern Mexico, and westward up the Rio Grande valley to the high plateau in the south-western part of the state. It is this species which is now such a common and splendid ornament of the gardens of Austin, San Antonio and other cities and towns of western Texas. The portrait of one of these cultivated plants was published in the first volume of this journal (f. 10).

On the plateau of south-western Texas another arborescent species is very abundant and by far the most conspicuous feature of the vegetation in this part of the country. This is the *Yucca baccata macrocarpa* of Torrey, who united it with the stemless *Yucca baccata* of the Colorado plains, the *Yucca baccata australis* of Engelmann, the *Yucca australis* of Trelease, and the largest of the Yuccas that grow naturally within the territory of the United States. The distribution of this noble plant, which is occasionally forty feet high, is not yet satisfactorily determined. It ranges westward across the Rio Grande into New Mexico, but how far is not yet known; and it is probably this species which is seen by the traveler on the Mexican Central Railroad in Chihuahua. It may be distinguished from *Yucca Treculiana*, with which it grows near Sierra Blanca, in south-western Texas, by its deep green flat leaves, by the longer pendulous branches of the flower-cluster, by the larger and narrower flowers which hang gracefully on long slender pedicels and by the slender hooked beak of the fruit. A young tree of this *Yucca* was cut last April at Sierra Blanca and sent to New York to represent the species in the Jesup Collection of North American Woods in the American Museum of Natural History. After its long journey to New York by rail and ocean the rootless plant developed its flower-cluster in the Museum, where it was photographed by Mr. De L. C. Laudy, of the Museum. A reproduction of this photograph appears on page 305 of this issue and gives some idea of the habit of a small plant of this species, and of the form and character of its magnificent cluster of flowers, which well distinguish it from *Yucca baccata*.

From the plains of western Texas another species ranges over those of southern New Mexico and Arizona and the adjacent borders of Mexico. This is *Yucca elata*, a plant of entirely different aspect, with a slender stem ten or twelve feet tall, branched and clothed at the top with short, narrow, rigid leaves, each branch being surmounted in early summer with a branched panicle of flowers often five feet long, and raised on a slender stalk from seven to ten feet high. At Deming, in New Mexico, at the junction of the Southern Pacific and Atchison, Topeka & Santa Fé Railroads, this plant begins to be abundant, and a little farther west it dots in countless thousands the desert which

it enlivens with its glorious panicles of flowers. A portrait of this plant was published on page 568 of the second volume of this journal.

So far as is now known, our fifth arborescent species is confined to the high mountain ranges of southern Arizona and northern Sonora. This is the *Yucca Schotti* of Engelmann, who afterward gave the name of *macrocarpa* to the same species. This is a flat green-leaved plant sometimes twenty feet high, and is easily distinguished from all our other *Yuccas* by the thick coat of white tomentum which covers the stem and branches of the flower-panicle. It is the only arborescent *Yucca* of the United States which grows on mountains, the other species being found on plains and deserts. Nowhere very common, it appears to grow most abundantly and to its largest size at elevations of from five to seven thousand feet above the level of the sea, although it is occasionally found at lower elevations where cañons open out into the mesas. This is probably the least known of all our *Yuccas* in cultivation. There are a few noble specimens, however, in the gardens of Tucson, Arizona, and seeds were distributed last year by the Arnold Arboretum. West of the Colorado River *Yucca arborescens*, or, as it is more commonly known, *Yucca brevifolia*, forms open, straggling forests on the Mohave Desert, and ranges to western Arizona, southern Nevada and southeastern Utah. This is a much-branched tree from thirty to forty feet high, with short rigid blue-green leaves and compact sessile clusters of small flowers. No forests on this continent are so weird as those of this tree, which is a source of never-ending astonishment and delight to travelers on the railroads that cross the Mohave Desert.

The last of our tree *Yuccas* is distributed from southern Nevada over the Mohave Desert, where it is not very abundant, through the passes of the San Bernardino Mountains to the California coast, along which it ranges northward as far as Monterey and southward into Lower California. This is the common and only arborescent *Yucca* of southwestern California, and is sometimes of tree-like habit, but more often produces from the ground several spreading stems. Long confounded with the stemless *Yucca baccata* of higher and more interior regions, it was first distinguished, under the name of *Yucca macrocarpa*, from that species by Doctors Merriam and Coville in their reports on the Death Valley Expedition. The name *macrocarpa*, however, having been previously applied to two other species of *Yucca*, this coast species is still in need of a name.

Our tree *Yuccas* all produce baccate, succulent, sweet, edible fruit, with the exception of *Yucca elata* and *Yucca arborescens*; that of the former is dry and pod like, and that of the latter is covered with a thin coat of flesh, but does not split open like the fruit of *Yucca elata* and the other species with dry fruits.

Japanese Vegetation in California.

THE tendency toward extensive planting of Japanese trees, shrubs and flowers, particularly in the coast counties, grows more and more evident from year to year. Japanese gardeners are visibly increasing in numbers; the close of the war has already stimulated immigration. Nor is it only the gardener-class that counts in this respect. If California, as appears probable, is to have fifty or sixty thousand Japanese merchants, students and laborers of every class, oriental forms of gardening art will be fostered by all the newcomers, and the plants of Japan will be even more in demand. Some energetic importers have aroused public interest in Japanese vegetation; now we have local nurseries also, which prove attractive to Americans, and I expect to see the little Japanese gardener an indispensable adjunct of a fashionable country house before many years pass.

The Golden Gate Park possesses a good illustration of Japanese garden art, developed from the best of several gardens begun there during the early part of 1894 for the Midwinter Fair. Adults as well as children derive constant pleasure

from these miniature landscape-gardens. What a terrible national genius such gardens exhibit! Century-old Pines and Oaks, crags, mountains, rivers and the whole free wilderness one sees compressed into lilliputian dimensions with an exacting, relentless energy concealed under childlike smiles. The children, who love the garden, feel only its beauty; but older persons cannot forget its esoteric significance. A thousand years hence, when every inch of land in America is precious, may not such gardens become one of the leading types, even here?

At present such a possibility seems very distant. The mere increase of Japanese vegetation in its natural forms is wholly consistent with occidental garden ideas. Everywhere one sees evidences that many of the characteristic plants of Japan are becoming naturalized. Among trees I note especially *Salisburia adiantifolia*, *Sciadopanax verticillata* and *Laurus Camphora*, all of which are becoming popular, and the latter extremely so. The Camphor and the lilac-flowered *Paulownia imperialis* are exceptions to the general rule that Japanese plants only thrive in the Coast Range valleys, for one finds extremely healthy specimens even in the hotter parts of the San Joaquin Valley. I measured a *Paulownia*-tree not long ago that, having grown two years from seed, and accidentally broken off at the surface, had sent up in one season a stem eighteen feet high and over two inches in diameter. The *Paulownia*, massed on hillsides with golden *Acacias*, is in its properly effective place, and southern Californians are beginning to use it on a large scale. Oaks of east Asia are only in nurseries as yet, but Oak planters, who are but few in any generation, are watching them with much interest. The deciduous *Magnolias* begin to be fairly abundant. One nursery has sold 20,000 trees in the past ten years, including seven or eight species, and now has half an acre devoted to this brilliant spring-flowering tree.

Another pleasant incident is the increased planting of the Bamboos. There is little or no botanical classification as yet, but the common varieties and several good species of Japanese Bamboos are quite often seen in gardens. There is talk of making a tree-lined avenue from San Francisco to San José, nearly forty miles. If carried along the foot-hills, such an avenue would cross many streams and moist places, where clumps of the hardier species of the giant Bamboo might safely be planted, so as to give what is now an almost unknown effect in the California landscape.

The Japan Maples thrive within reach of the sea air. Superb specimens of all the rich-colored cut-leaved varieties are to be seen in Sonoma, Marin, Alameda, Santa Clara and southward to Los Angeles, but without special care they usually fail to prosper inland. There is no reason why they should not be grafted on stronger-growing native species, and some of the dwarfed plants which come from Japan strike deeper root and become almost trees. To the Japanese gardeners such a Maple must seem a mere monstrosity, and I have seen them look upon one with serious disapproval. They feel much the same way about grafting the pretty little Dwarf Orange, the *Oonshiu*, on some sturdy standard seedling, where it soon makes a large head and bears fruit of twice the usual size.

Among more brilliant lesser shrubs, the Tree Paeony of Japan bids fair to become a notable California flower. Not that one sees it frequently as yet, but many are planted and growing, and showy masses of them attract much admiration and inspire more extensive planting. The roots are usually somewhat expensive, though I have sometimes seen good collections of fifty named varieties sold for \$25.00 per hundred, but this was rather late in the spring, when care was needed to establish them. They bloom early in April, a full month before the herbaceous Paeonies, and in old gardens the plants stand four or five feet high. They are eminently adapted to all parts of the Pacific coast.

Camellias, though grown in houses, are properly outdoor shrubs in most parts of California, and very large importations have been made from Japan. The largest *Camellia*-tree I have seen brought over was about twenty

feet high, and sold for \$300. Around the State Capitol Building in Sacramento are many large and fine Camellia-bushes, and venders of the flowers crowd the legislative halls. It is hard to rank any one of the Coast Range cities as first in the matter of Camellias. San Rafael, Santa Cruz, Santa Barbara and others are brilliant in winter with this classic flower, which is sometimes in outdoor bloom from December to the end of May.

Chrysanthemums, Lilies, Irises and Lotuses are every year more extensively planted in California, and Japanese sources supply a large part of the stock. They are not likely to become in any sense broadly characteristic of California gardens, except as they are grown with especial ease here, and so may usurp a larger share of space. Madame Chrysanthème seems to place her seal on the whole autumn and early winter here, so long is the season of blossoming. Like the willful little woman of Pierre Loti's Japanese novel, she is both a fascination and a disappointment.

Berkeley, Calif.

Charles Howard Shinn.

Oil of Birch.

IT is not generally known that the Sweet Birch, Black Birch or Cherry Birch, *Betula lenta*, which is an important timber tree, is also of considerable economic value for its aromatic constituent, the oil of birch. Many of the mountain forests of eastern Pennsylvania and northern New Jersey are abundantly supplied with this Birch. Instead of a tree fifty to sixty feet in height, it is oftener found on the mountain sides as a shrub from ten to twenty-five feet high. In Schuylkill, Carbon and Luzerne counties, Pennsylvania, numerous distillers are located, who manufacture the oil in conjunction with that of wintergreen. The two oils being chemically and physically identical, they are made and sold indiscriminately as oil of wintergreen, tea-tree or gaultheria.

During the summer months wintergreen is employed in the manufacture of the oil, since it can then be collected by the cheap labor of women and children, but in winter and spring, when the ground is covered with snow, Birch is used almost exclusively. The distiller locates where he can get good water and plenty of the Birch. The latter is cut when from ten to twenty-five feet in height; the stumps sprout again, and in five to ten years are ready for a second cutting. The trees are hauled or dragged to the distillery, where, by means of a water-wheel and a trip-hammer device, in which one or two heavy knives take the place of the hammer, the trunks and branches are cut into pieces one or two inches in length. The stills hold from half a ton to a ton, and consist of wooden boxes with copper bottoms, and in some cases copper heads also. They are filled to within twelve inches of the top, water is run in to one-third the contents of the still, and after macerating overnight distillation is commenced by means of a wood-fire. The vapor is conducted into a copper or tin worm, placed in a barrel, and kept cooled by a continuous stream of water from a cold mountain stream. The steam is condensed in this coil and issues below as mixed oil and water. The oil in this case, being heavier than water, settles to the bottom of the receiver, which is usually a quart fruit-jar, while the water is conducted off and run into a barrel to be used again with the next lot of wood.

The yield of oil of birch is about four pounds from one ton of the wood—that, is from two-tenths to three-tenths of one per cent. Some distillers state that the yield is greatest in July and August, but in a visit to Luzerne County in 1890 I gathered the impression from those consulted that the greatest yield was obtained in the months of April and May. All agree that very little oil is obtained in October, when the leaves are falling. In the vicinity of White Haven, in the same county, there are from six to eight distilleries that produced in 1890 a total of some three or four thousand pounds of the oil. Since then the artificial oil of

wintergreen, made from salicylic acid and wood alcohol, has been placed on the market at such a price as to very much lessen the production of oil of birch. While the artificial oil is not identical with the oils of birch and wintergreen, yet it is so near that only an expert can detect the difference.

The production of the natural oils commenced in Luzerne County about the year 1865, and, as they are preferable for medicinal use, there will probably continue to be a demand sufficient to maintain the industry in its present proportions.

College of Pharmacy, Philadelphia.

Henry Trimble.

Notes from a Botanic Garden.—I.

IN a very modest way the beginning of a botanic garden was made here in 1877, along a shady bank near the brook and not far from the greenhouses. The garden now under consideration consists of three acres, lying on the north bank of the Cedar River and extending to the north-east on both sides of a small brook. This area does not include the arboretum, nor the greenhouses, nor the adjoining lawn and flower-beds and plats of shrubbery, with their numerous varieties and races. The space of which I now speak consists largely of the higher portion of the river flats, mostly above high-water mark. On the banks are a variety of shrubs and small trees of nature's own planting. The artificial portion of this garden, then, consists mainly of hardy herbs, with a few shrubs—1,200 to 1,500 species. At first, considerable pains was taken to make, by means of bowlder stones, small pockets a foot or two in diameter for each species, but in dry times the small plants wilted, while the woody growth, rooting deeper, absorbed the moisture and thrived. At present, the sloping banks are devoted almost exclusively to the families containing many woody plants, while the herbs have slid down to the low flat land, which most of them seem to like very well.

In this new state and in this utilitarian age at the oldest agricultural college in America, we are still occasionally called on to rise and explain the uses of a botanic garden. I am happy to state, however, that this question has never been asked by people who visited the garden. Inquiries have frequently been made by people from the country, the village and the city; comments without end have been overheard, and with scarcely an exception this "novel sort of a garden" awakens their interest at once. We aim to grow (by no means always successfully) a plat of each species two to six feet in diameter, large enough to fill the eye, that the botanist, the artist, the florist may see how he likes it. Where the piece is rather large there is much less danger of losing the whole than where but little is grown. The farmer can compare some of the newer untried sorts of grasses or other forage-plants by the side of his old favorites, or he can see behind a label containing its name some weed-pest that has lately found its way into his neighborhood. The bee-keeper looks for the plants and their names where honey is gathered in most abundance. The entomologist learns to look for certain insects on the plants of a certain family or species. At a farmers' institute last winter no topic attracted greater attention than the mention of a family of mints represented by some fifty or more species in our botanic garden. Several present expressed a determination to pay the garden a visit for the purpose of looking for something new and promising for distillation. They hoped we would extend the list by introductions from other countries.

Many kinds of pretty wild plants are not well known by people in general, especially since the woods have been cut away or pastured and the swamps drained and placed under cultivation, or frequently burned over. Even along the roadside, in many places the fences have been removed and grasses, grains and potatoes come nearly to the tracks made by the wheels. In the vicinity of college or high-school, the herbarium fiend ransacks the wild places for

choice plants, which he removes, root and branch, in large numbers. Sometimes the roots are removed to supply the eastern market. By these methods the choicer plants are driven farther and farther over the hills or back into remote swamps and small patches of forest.

A botanic garden of some extent is now becoming almost a necessity for supplying students of school or college with suitable materials for illustration and study. At this college, where the academic year includes the summer months, a garden is especially valuable. Here each student may find suitable plants for the study of fertilization by insects; or a comparison of the tendrils, the runners, root-stocks, a study of various twining plants, or almost anything needed for a thesis in botany, or for making notes to present to the botany club or natural-history society. Every little while the amateur or the professional florist has his attention called to the peculiar value of some aquatic, climber, shrub, or what he supposed was nothing but a weed. He adds it to his garden. These benefits of a botanic garden are not yet fully appreciated, though ours is a favorite place for young students from neighboring schools. Until seen in their prime, no one can imagine the different shades of color, the various forms in general outline and in detail, and the endless number of positions assumed by stem, leaf, inflorescence, bud and flower.

No one learns so much from the garden as the person who selects, arranges and cares for the plants. He is both student and experimenter, and the more he learns the better it will be for his pupils. At one time he is nearly outwitted by the moles that undermine his favorites of the dry, sandy knoll; at another it is the plant-lice on the wild Asters or Water-lilies, the blister-beetles coming in great swarms to strip the Lupines, Coffee-trees or Baptisias, or, again, it is the muskrats which devour the root-stocks of the aquatics, or the striped squirrels which feast on the Putty-root. He finds that June freshets decimate some plants not accustomed to long inundations in time of growth. Among such are Spikenard, Ginseng, Adder's-tongue, Burdock, Dandelion, Catnip, Motherwort, Wild Lettuce, Mayweed, Mallow, Plantain and many more.

Some fifteen years ago plants of *Marsilia quadrifolia* were introduced into one of the ponds, and soon spread all around it and sent forth long stems into the water where it was two feet deep or more. For some feet near the shore the surface of the water was covered with these beautiful leaves. Then water-snails, finding plenty of suitable food, multiplied, and the *Marsilia* retreated to the shore in a few spots in the grass, awaiting better times. We still grow it well in the mud a few inches above the water. Last winter the thick ice during a long cold, two months or more, killed the snails as well as the fish, and this summer the *Marsilia* has again invaded the water. Wild Rice in like manner was kept in check by the snails, but this year it grows in water two feet or more in depth.

W. J. Beal.

Agricultural College, Michigan.

Foreign Correspondence.

London Letter.

ÆSCHYNANTHUS HILDEBRANDII.—This is a charming little plant, a veritable alpine, with all the attributes of the pygmy beauties of the rock-garden, such as Gentian and Androsace. It is quite happy when grown in a cold greenhouse, forming compact tufts of stems three inches high, clothed with green ovate fleshy leaves an inch long and a terminal cluster of four or more bright scarlet and crimson flowers, each an inch long, with the upper segments united and forming a hood, the one lower segment being turned down and suggesting a well-protruded tongue. The figure in the *Botanical Magazine* (t. 7365) does the plant scant justice, but it was prepared from a specimen which flowered in a stove. Mr. Hildebrand, of the Shan States, Burma, after whom this species was named, and who sent seeds and plants of it to Kew last year, says that on the high hills in Burma it

forms dense tufts on the trunks of trees in very moist situations, and when in flower it looks like a cushion of scarlet velvet. It is certain to find general favor.

CRINUM AUGUSTUM.—The finest specimen I have ever seen of this grand *Crinum* is the result of novel treatment, for a *Crinum* at any rate. Three months ago Messrs. F. Sander & Co. presented to Kew a bulb of an unnamed *Crinum* of extraordinary size, being nearly two feet long and eight inches in diameter. It was planted in a twelve-inch pot and half-submerged in the water of the tank in which the tropical Water-lilies are grown. Here it started into vigorous growth, and it now has about a dozen leaves, some of them being three feet long by six inches in width; it also bears a stout scape three feet long, with an umbel of forty flowers and buds; each flower is eight inches across from tip to tip of the elegantly recurved segments, the color is rich crimson outside, paler inside, and the odor is powerful and delicious. A second scape, quite as strong as the first, is rapidly pushing. We have no more attractive plant among the many specimens cultivated.

HEDYCHIUM ANGUSTIFOLIUM × GARDNERIANUM.—The *Hedychiums* are happiest when grown in very large pots of rich soil and partially submerged in the water of a warm tank in an unshaded house. At Kew this treatment is followed for a selection of the best of the species and several hybrids raised about ten years ago in the Edinburgh Botanic Gardens. The finest of the latter is that named above. It has erect stout stems five feet long, clothed with dark green leaves a foot long and terminated by an erect spike, nine inches long and four inches through, of rich red, almost crimson flowers. Another handsome hybrid is a cross between *H. Gardnerianum* and *H. coronarium*, which has all the fragrance and delicacy of flower of the latter, with the shorter, sturdier stems and free-flowering nature of the former parent. Growers of tropical aquatic plants will find these *Hedychiums* excellent companions to *Nymphaeas*, *Nelumbiums*, *Papyrus*, etc.

BEGONIA CARMINATA.—The shrubby evergreen species of *Begonia* are now receiving attention from hybridists, and we have already some very beautiful hybrids, namely, President Carnot, Paul Bruant, Diadem, etc. Messrs. J. Veitch & Sons have added another by crossing the elegant, richly colored *B. coccinea* (*corallina*) with *B. Dregie*, an African species, with deciduous stems and a fleshy potato-like tuber. The hybrid has a good deal of the habit of *B. coccinea*, the branches being semi-drooping and the leaves wavy and lobed. The flowers are borne in large drooping, branched umbels, and they are colored rose-carmine. Although the plants shown were small, they were well flowered, a character inherited from *B. Dregie*.

PRIMULA IMPERIALIS is at its best now in a cold greenhouse at Kew. The leaves are a foot long and three inches wide, the flower-spikes three feet high, each with five or six crowded whorls of deep yellow flowers. We find that this species is practically biennial; at any rate, we have not been successful in keeping any of the plants after they have flowered, and they flower in about two years from seeds. They ripen seeds freely under cultivation. Although coming from such a high altitude on the Java mountain, where severe frost is experienced, this *Primula* will not live out-of-doors through the winter at Kew. The best position for it is in a house where *Masdevallias* thrive, or it may be grown along with the greenhouse *Cinerarias*. We have seeds ripening on a plant of *P. Japonica*, fertilized with pollen from *P. imperialis*, an interesting cross.

HEMEROCALLIS AURANTIACA is the name of a distinct-looking, handsome Day Lily which was awarded a first-class certificate this week by the Royal Horticultural Society. It was shown by Messrs. Wallace, of Colchester, who obtained it from Japan, where it is said to have been found wild among *Iris Kämpferi*. In stature and general characters it resembles *H. fulva*, but the flowers are six inches in diameter and of a uniform deep yellow color. Mr. Wallace thinks it may be a variety of *H. fulva* (*disticha*), but Mr. Baker considers it a fine form of *H. Dumortieri*. Whatever

its affinity, it is a handsome addition to the cultivated *Hemerocallis*, which are among the most useful of all hardy *Liliaceæ*. *H. flava* is satisfactory when grown in pots for the conservatory.

SENECIO MACROPHYLLUS.—A large specimen of this noble Caucasian species is now the most striking plant in the herbaceous garden at Kew. It is a tuft six feet through, formed of erect spathulate leaves three feet long and a foot in width, glaucous-green, with a whitish midrib and dentate margins. The spikes, of which there are twelve, rise erect to a height of six feet, and they are sturdy enough to support themselves in the roughest weather.

tions, notably in *GARDEN AND FOREST*, vol. i., page 6. It was shown in flower this week at the meeting of the Royal Horticultural Society and obtained a first-class certificate. It is taller and larger in all its parts than the older *Arnebia echoioides*, the Prophet flower, and the flowers are richer in color. The singular character of changing color, observable in the flowers of the latter species, is possessed by *A. cornuta*. It should be sown in pots or boxes in a frame in February and planted outside in light rich soil in June. There are plants of it in flower now in the border at Kew.

London.

W. Watson.



Fig. 42.—*Yucca macrocarpa*.—See page 301.

The flowers are crowded in a branched raceme over a foot in length and six inches through, their color being bright golden-yellow. All through the hot dry weather of the last six weeks this plant has been an attraction, and it promises to keep on for some weeks longer. I have never seen this species anywhere except at Kew, where, however, it has been grown in its present position for at least fifteen years. It is a noble plant in every sense. Another name for it is *Ligularia macrophylla*.

ARNEBIA CORNUTA.—This pretty annual was introduced to Kew from Afghanistan seven years ago by Dr. Aitchison, when it was figured and described in various publica-

Plant Notes.

STENANDRIUM LINDENII.—This is one of the most effective plants that have been introduced for years. It is of a low, trailing habit, but the stems are short and fleshy, forming a compact mass of leaves. Like so many other fine-leaved plants, it belongs to the natural order *Acanthaceæ*. The flowers are insignificant, yellow, borne on close-bracted spikes, and look neat, but not showy. The leaves are obovate in outline, of a rich velvety green, with yellow variegation along the veins. This is a useful plant for vases and window-boxes, and will probably in time prove effective for bedding. Propagation in brisk bottom-heat is comparatively easy; cuttings will root in ten or twelve days. The young plants will grow best in a rich vegetable soil with plenty of sand.

STIGMAPHYLLON CILIATUM.—We have more than once invited attention to this plant, but it is worth repeating that it ought not to be neglected by any one who is looking for a reliable climber that will grow anywhere—in a greenhouse or in a parlor. It is very free-flowering even when small. The yellow flowers are about an inch and a half in diameter; the five petals, with undulate fringed edges, are elliptical, or sometimes kidney-shaped, and narrowed to a long claw at the base. The inflorescence is in few-flowered corymbs. The opposite leaves are heart-shaped, with a ciliated edge and a satiny surface, and are borne on short slender petioles. The slender twining stems grow to a considerable length. The foliage is abundant and quite ornamental. The plants thrive in a rich fibrous soil in a warm sunny position, and require generous watering, and they will do very well in comparatively small pots, although when they have abundant root-room they will be more vigorous and floriferous. In color and form the flowers suggest those of an *Oncidium*. It is practically ever-blooming, but when cut back hard in autumn it will flower on the young shoots abundantly all summer. It is propagated from cuttings in bottom-heat.

SMILAX ARGYREÆA.—Since the introduction of the beautiful, but now exceedingly rare, *Smilax ornata* no climber of this genus has been cultivated as a greenhouse climber. The present species is somewhat different in habit, altogether more promising, and probably a plant of lasting value. The leaves are longer than those of *S. ornata*, eight or ten inches when fully developed, lanceolate, abruptly ending in a short petiole, with three principal, equidistant and almost parallel veins. The texture is somewhat leathery, and the color a fine silvery gray, with deep green blotches. The stem is very wiry and slender, twining and climbing by means of long tendrils and short stout thorns. As it is a robust healthy grower, doing well in a moderate temperature and forming very ornamental specimens quickly, this plant will probably be very valuable. It looks best trained on a globular or conical frame of wire. It is propagated from half-ripe cuttings taken from slender side-shoots with two or three eyes, and inserted in a moderately warm bed. The soil should be rich and fibrous, as for all plants of its class, and the position light and sunny.

MALOPE MALACOIDES.—This is a charming old-fashioned annual plant, a native of the south of Europe, which is not

now very often seen in our gardens, although it is easy to cultivate and the flowers are very beautiful, with clear pink corollas three or four inches across, marked within at the base with purple longitudinal stripes; they are solitary on long stems from the axils of the leaves, and keep on appearing from the end of June through the summer, or as long as the plants continue to grow. The leaves are oblong-ovate, crenate, wedge-shaped at the base and long-stalked, and in rich well-drained soil the plants will grow to the height of about two feet. Although, perhaps, most attractive on the plants, which should be used in masses, the flowers last a long time when cut, and are well suited to arrange in vases.

IRIS JAPONICA.—This Iris, also known as *I. Chinensis* and *I. fimbriata*, is valued, wherever known, as a very attractive greenhouse perennial. It has been in cultivation about a century, but is still a plant too seldom seen, especially as it is attractive in leaf as well as flower. The dark green leaves are sword-shaped, somewhat lax, and borne in fan-shaped clusters. The plants usually flower in early spring on stems as long as the leaves, and these, with the many heads, form a true raceme. The individual flowers fade with the day, but are quickly succeeded by others from the three or four flowered spathes. They are very beautiful; the color is a delicate light blue, with orange-yellow crest and markings of the same color on a white ground on the falls. This ground is bounded by a row of lavender lines and dots, which are darker in hue than the body color. The segments are also beautifully fimbriated on all the edges, and are spread out Morea-like. The style crests are also deeply cut and fimbriated. The cultural requirements of this Iris seem to be the growth, from flowering time, in open, rich soil, with some peat and sand and good drainage, in order to produce well-matured plants in the early year.

BRAVOA GEMINIFLORA.—This twin-flowered Amaryllid is a tuberous-rooted plant from the mountains of central Mexico. As it occurs at high altitudes it would probably be hardy here with slight protection. It has narrow leaves one and a half feet long, and flower-spikes six inches to a foot longer. The flowers are borne in distant pairs on opposite sides of the stem. They are an inch long, narrow, trumpet-shaped, and orange-red in color. They are drooping and show little of the lighter inner color which the protruding anthers also serve to hide. This plant is interesting rather than showy or ornamental.

PINUS KORAIENSIS AND *P. PARVIFLORA*.—Pine-trees small enough not to outgrow, without continual mutilation, the limits of a small lawn are not very numerous, although there is a demand for such plants to take the place of large trees, like the Austrian Pine and the Norway Spruce, which are often planted in spaces only a few yards square, and, of course, have to be rooted up long before they reach half their natural size. There are, however, two small Pines from north-eastern Asia which are well suited to decorate small lawns in this country, and it is a pity that they are so little known and so rarely planted. They are *Pinus Koraiensis* and *P. parviflora*, species with five leaves in the leaf-cluster, like our White Pine, short cones with thick scales, and large edible seeds. *P. Koraiensis* is usually not more than thirty feet high when fully grown, and forms a broad round-topped cone, with its lower branches resting on the ground. The leaves are pale green, and as they do not fall until the end of three or four years, the appearance of the tree is more leafy and much denser than many of the other White Pines which lose their leaves much earlier. This density of foliage and the light orange-red color of the young shoots distinguish this Pine, and make it an exceedingly attractive object. It is very hardy as far north, at least, as New England, and there are already several specimens in this country from twenty to twenty-five feet in height. As its name implies, *P. Koraiensis* is a native of the Corean peninsula, where it is said to be abundant, as it is in the Manchurian coast regions. Like several other trees, it was carried to Japan nearly a thousand years

ago by Buddhist priests, and is still occasionally planted in their temple gardens. From these cultivated trees the species was first described and figured by Siebold and Zuccarini in their *Flora of Japan*.

Pinus parviflora is a somewhat larger tree; it grows sometimes on the mountains of northern Japan to the height of sixty or seventy feet, overtopping the forests of deciduous trees with its handsome head of long graceful, somewhat pendulous, branches, and relieving the monotony of the sky-line just as our White Pine stands like a sentinel over the sylvan landscape of eastern America. The leaves of *P. parviflora* are short, silvery white in color, and much clustered on short branchlets springing from the long flexible branches, which form broad distinct whorls about the stem. There are specimens of this tree in the eastern United States about twenty feet high which are every year covered with cones, but they show no disposition yet to produce the tall naked trunks found in the Japanese forests, and still retain their lower limbs. These are shorter than some of the more vigorous branches above them, so that the shape of the young tree is obconical and very irregular, the branches on one side sometimes growing much longer than those on the other. This Pine is able to resist the most severe cold; it is extremely picturesque in habit, which in its young state is entirely unlike that of any other Pine-tree, and it is delightful in color. The cones, however, which are produced in profusion and turn nearly black after the seeds are shed, do not fall for several years, and somewhat disfigure the appearance of the tree, which is otherwise one of the most satisfactory of all the conifers of moderate size that can be grown in the northern United States.

Cultural Department.

Air Drainage in Orchards.

THE presence of a large body of water is a protection to orchards, but only while it is open water. As soon as it is sealed by freezing it is no longer a protection; and as rivers and lakes occupy depressions in the earth's surface, their immediate vicinity is subject to a lower temperature than more elevated territory, in consequence of what is popularly called the setting of the cold air into the lowest spots. The realization of this fact came to me slowly. My "Old Place" is close to Lake Memphremagog, which is a decided protection against frosts so long as the lake remains open; yet I learned that on the surrounding hills some varieties of Apples, and even a few Pears, could be successfully grown, which, with me, were destroyed by the test winters.

In the six years that I have been in possession of an upland farm, two to three miles from the lake, I have had an opportunity to note these facts more fully, and to study the subject more thoroughly. In the country about Lake Champlain, the deeper parts of which often remain unfrozen nearly all winter, the Baldwin Apple is grown with success, though with some risk of injury to the trees in abnormally cold winters; but Lake Champlain lies nearly a thousand feet lower than Lake Memphremagog.

The efforts which have been made in the past thirty years to extend orcharding into the mountain regions of this state have been costly; but by patience and perseverance, and by the introduction of the tree-fruits of Russia, the principal difficulties have been measurably overcome. Still, as yet, very few of our orchardists fully understand this matter of air drainage—the fact that low valleys are colder when it is cold, as well as warmer when it is warm, and the consequences which follow therefrom. Not only do we lose more trees by winter-killing in the valleys, but in time we find that even the hardier trees, which are not killed, and for some time are apparently not injured, are gradually weakened, and thus decline in thrift and vigor. This decline is becoming more and more manifest as time passes, and it tends more and more to push orcharding back into the hills. Antagonizing influences, however, are found in the fact that the hill farmers—with exceptions, however—have commonly less capital, less confidence in fruit-growing, and are farther from the markets and from transportation facilities. The last obstacle, however, will, I believe, be soon overcome by branch lines of railway, of narrow-gauge and cheap equipment, with electric propulsion

cheaply supplied from the abundant water-power of our mountain lakes and streams. These will be rapidly constructed, to the great advantage of our hill farmers.

It is important that the facts above noted should be widely known, because such knowledge will materially aid in the selection of suitable sites for orchards, where the trees, carefully cared for, may be expected to survive and yield a profit to those who plant them for a long series of years. Pioneers like myself, having nearly reached the limit of human existence, can only hope to aid, by their long experience and many mistakes and failures, to make the way easier for those who will come after them. That our northern border states will hereafter yield an increasing supply of tree-fruits to the markets of the country can no longer be doubted. But this will not be achieved without careful study of all the conditions, which must be carefully allowed for.

Newport, Vt.

T. H. Hoskins.

Cupheas.

THE genus *Cuphea* contains a number of showy perennial and annual plants. Some of the evergreen perennial species are quite well known in gardens, but the annuals are seldom seen outside of a botanic garden. The perennial species are very easily raised from cuttings made of the young growth in March or April. If the cuttings are inserted in a propagating-bed in clean sharp sand, with a good bottom-heat, they root in about two weeks. When rooted they should be put into two or three inch pots and then placed on a hot-bed, where they soon make neat dwarf bushy plants. About the middle of May they may be planted out into the beds, where they will flower all summer; in fact, we can hardly ever find them without flowers. When there is danger of frost in the fall some of the plants should be potted and put into the greenhouse, where they bloom all winter. From these plants we raise our stock for the following year.

The annual species are very interesting, and some of them are showy when in bloom. They are raised from seed, which is sown in April, and the plants are grown along until May, when they are planted out. They soon begin to blossom, and continue flowering until they are destroyed by frost in the fall.

Perhaps the best-known perennial species is *Cuphea ignea*, which is also often found under the specific name, *platycentra*. It is a neat half-shrubby plant eight to twelve inches high, and its stems are thickly set with opposite, nearly glabrous, glossy green, lanceolate leaves. The plant bears a profusion of flowers, which are produced between each pair of leaves. The tubular apetalous flowers are about one inch long, of a bright scarlet color, and have a black and white expanded limb. This *Cuphea* is well adapted for small beds in the flower garden. It is a Mexican plant, and was introduced here in 1845. The common name of this plant is the Cigar-plant.

Cuphea lanceolata is a hispid, clammy Mexican annual, which grows about one foot and a half high. Its stems are thickly covered with long brown clammy hairs, and are clothed with opposite oblong-lanceolate leaves, which taper at the base into short petioles. The flowers of this plant are rather large and showy, and are in racemes on the branches. The calyx is of a purplish color, about one inch long, and the petals are bluish, the two upper ones being the largest and showiest. This plant begins to flower when not more than six inches high, and keeps on blooming until late in the fall.

The Clammy *Cuphea*, *C. viscosissima*, is an annual, found growing in sandy fields from Connecticut to Illinois. If conditions are favorable for its growth it will soon attain a height of two feet. It is curious that this is not numbered among insect-catching plants. A small branch a foot long now before me has no less than eighteen small insects captured on its clammy hairy stem. It is a branched plant with alternate branches and opposite leaves. Its flowers are of a rich purple-violet color, and when massed together they are very showy.

Cuphea hyssopifolia is a dwarf perennial from Mexico, which is grown in the greenhouse in the winter and used in the summer for borders of small beds. It is about six inches high, and its stems and branches are thickly covered with small linear oblong leaves. The flowers, although small, are plentiful, and are of a pinkish color.

Another *Cuphea* in bloom now is *C. mimata*. It has pale vermilion solitary flowers, which are abundant until October. The height of this Mexican annual is about two feet.

The showiest *Cuphea* in bloom now is *C. Llavea*. It is a perennial species that was introduced from the mountains of central Mexico in 1830. Its flowers are large and showy, and are in few-flowered short racemes. The two

large petals are the showiest part of the flower, and are of a deep red color. This *Cuphea* grows about a foot high, and it makes a neat bedding-plant, with plenty of flowers all summer.

Harvard Botanic Garden.

R. Cameron.

The Flower Garden.

PERENNIAL plants especially have reveled in the recent showery weather and have made rampant growth. The increasing popularity of old-fashioned hardy plants is more evident each year; less carpet-bedding is seen, and where tender plants are largely used mixed tropical beds or beds of flowering plants, as Cannas, are replacing the formal, and often grotesque, color designs.

At this season the perennial borders are well filled, and not much bare ground is seen. Many of the taller-growing sorts, such as *Helianthus*, *Rudbeckias*, *Heliopsis* and *Asters*, will need to be securely staked for protection against wind and heavy rains. Many plants which have finished blooming should have the old flower-heads removed before the seed ripens. Some plants like *Papaver orientale* are little better than noxious weeds if their seeds are scattered over the borders. This is a good time to make note of the heights of various plants and to mark for removal in the fall those not properly placed and any which may be overcrowded. Weeds must be kept down by the hoe or by hand. They often grow inside the clumps of flowering plants, and can only be removed by hand.

A sowing of Pansies may now be made. We use a frame with a northern slant for this purpose, and keep it shaded until the seedlings appear. *Trimardeau* and *Bagnots* proved the best of several strains tested this season. Hollyhocks should also now be sown. With slight protection these stand the winter here, but we keep a number in four-inch pots in a cold frame and plant them out in the spring to make certain of a crop. Seeds of Sweet William, Canterbury Bells, *Digitalis*, *Antirrhinum*, Wallflowers, etc., are now showing above ground, and when large enough to handle will be pricked off in a nursery-bed. *Antirrhinums* make capital winter-blooming plants, and a number of these placed in five-inch pots in October and held in a cold frame until the new year will prove useful in the conservatory later on.

Cannas are benefited by having the seed-pods removed as they form. These are the foremost tender bedding plants, as their increased cultivation testifies. The following are the best sorts now in bloom here: *Madame Crozy*, *Alphonse Bouvier*, *Queen Charlotte*, *F. R. Pierson*, *Gloire de Montet* and *Eldorado*. The first two kinds are still the best we have. Tuberous Begonias require staking where they have made good growth. A mulching of well-rotted cow-manure and plenty of water, with partial shade, are essential to their successful cultivation in the open. Geraniums should be gone over once a week and decaying flower-stems removed. Nothing spoils the appearance of a Geranium-bed so much as the neglect of this simple operation. Coleus, Stevia, Achyranthes and similar plants with colored leaves, as also *Alternanthera*, *Santolina* and other carpet-bedding plants, now make rapid growth, and a good deal of pinching is required. After heavy rains the hoe should be used to loosen up all bare ground. Grass verges need cutting weekly during weather such as we have lately had. A flower-bed loses half its beauty if the verges are not well kept.

Sweet Peas are helped by an occasional soaking of liquid manure, and it is best to give this after heavy rain. Seed-pods should not be allowed to form if a prolonged blooming season is desired. A good syringing on the evenings of hot days helps to keep down red spider and refreshes the plants. Our latest batch of Stocks and *Asters* has just been planted out. These are kept well watered; if allowed to become dry, aphid usually attacks the plants and ruins them. We have found watering with moderately strong tobacco-water the best remedy for this foe. A sharp lookout must be kept for the black Aster beetle, which usually makes its appearance with the first flowers. Killing by hand is the only safe remedy we know of for these destructive pests. Dahlias now require stout stakes well driven into the ground and should be looked over every ten days. After the main crop of roses is past the beds usually receive scant attention. Seed-pods should be removed, and if the plants are budded on the Briar, Manetti or De la Grifferaic stocks, suckers from these are sure to appear here and there and should be rubbed off or cut out. Marguerite and summer-flowering Carnations of the greenhouse kinds are now flowering freely. A little chemical fertilizer scattered between the rows and hoed in will be found helpful, and watering in dry weather is essential to success.

Taunton, Mass.

W. N. Craig.

The Rock Garden.

THE rock-garden in summer, like the herbaceous border, will appear ragged if not carefully gone over every week or two. There are two important overhaulings during a season. By the one in early spring some valuable lessons are learned, especially on the hardiness or non-hardiness of the newer additions; and, again, in summer the garden is improved by reducing the number of some kinds of plants, and the transplanting of seedlings and other plants from the reserve garden.

Campanulas are abundant, so that blue is the prevailing color. *C. Carpathica*, in several fine varieties and allied forms, is growing luxuriantly, including the beautiful *C. Carpathica turbinata* and the pure white-flowered variety. *C. Van Houttei* is probably the largest bell-flower of all. There are also *C. latifolia macrantha*, *C. Pallasii*, self-sown to the extent of needing continued weeding out; *C. Garganica*, the most diminutive, with clusters of pale blue. The dwarf Chinese Bell-flower, *C. grandiflora pumila*, better known as *Maresii*, belongs to the *Platycodon* section of the genus, and is distinguished by the spreading segments of the corolla, rather than by being bell-shaped. I measured one flower recently which was three and three-quarter inches across. The new *Ostrowskia magnifica* must belong to this group, judging from flowers seen recently at the Bussey Institute. There is also the white *C. alliariæfolia*, which, though rather coarse in habit, is quite handsome when in flower; the white *C. persicifolia* and the distinct *C. glomerata Dahurica*. A few noble spikes of a hybrid Cardinal-flower contrasts beautifully in color, helped by the charming little Slipperwort, *Calceolaria Mexicana*, which here is a hardy annual. The copper-toned Poppies, *Papaver pilosum* and *P. rupifragum*, biennial in character, almost bloom themselves to death, and bright little patches of Sea Pinks still linger on. *Sempervivums* and *Sedums*, in crevices and ledges along the paths, are especially attractive at this season. *Sedum acre* shows dense masses of yellow flowers; *S. Kamtschaticum* has paler flowers of the same color, and *S. lydium* charming pink blossoms. *S. Hispanicum* has glaucous foliage, *S. sexangulare* deep green, and *S. Anacampseros* rosettes of broad glaucous leaves on stoloniferous stems. Several *Sempervivums* are handsome in their flowering as well as in the neat rosettes of many shades of green. *S. arachnoideum*, the cobwebby Houseleek, is the most peculiar of all; *S. arenarium* has small globular rosettes of light green tinted with brown. *S. calcareum* is abundant in several forms, and also *S. Atlanticum*. Several species of *Dianthus* light up the rock-garden. *D. hybrida* is among the handsomest, having deeply fimbriated petals. *D. dentosus*, the Russian Pink, is a brilliant red; *D. cæsius* and *D. arenarius* complete the list.

T. D. Hatfield.

Wellesley, Mass.

The Tussock Moth, *Orgyia leucostigma*.

SO much has been said in Boston about the difficulty and expense of keeping the larvæ of the Tussock moth in check that we have asked Dr. E. B. Southwick, entomologist of the Central and city parks of New York, to give us an account of his experience with this insect. Dr. Southwick says:

First, the trees must be cleaned of egg-masses of the Tussock moth during the winter, for each mass of eggs will average between three and four hundred, and, when hatched, the larvæ will feed upon the young foliage in spring. This can be done more readily with steel brushes than is generally supposed. If this has not been done, the second thing to do is to spray the trees in the spring as soon as the caterpillars show themselves, while they are small and in colonies, spraying only those spots that are affected with London purple, and not attempting to spray the whole tree. By these preventive measures of careful watching and spraying in time the Tussock moth can be kept in subjection.

If it is too late to do this and the insects have defoliated the tree, the third thing is to jar down the larvæ with poles covered with rubber, so that the branches will not be bruised. A slight sudden jar will dislodge them, and they will fall to the ground. Two or three men should go ahead and jar them down, and let the spraying machine follow. As soon as they begin to ascend the trunks, spray them with an emulsion consisting of kerosene, six quarts; crude carbolic, four quarts; soap, six pounds, boiled together and mixed with one hundred gallons of water. Sprayed upon the larvæ, this emulsion will kill them. As fast as they come in from the grass and collect on the tree-trunks return and spray them again. This

should be done three or four times, when nearly all the larvæ affecting the tree will be destroyed. If this cannot be done, and the larvæ have come to the trunk and branches and formed their cocoons, as is the case with those in Boston now, the fourth thing to be done is to spray the cocoons with the same emulsion, and all that have not left their cocoons will be destroyed, and many of the eggs. With an extension pole, such as I use, one can reach fifty feet or more, and as most of the cocoons are on the under side of the branches they can be easily sprayed. I find that the Nixon nozzle is the best for this work, as it has great penetrating power and throws the spray through the thinly constructed cocoons of *Orgyia leucostigma*, while the Cyclone nozzle is, perhaps, the best for spraying the foliage. After spraying the cocoons they can be removed with steel brushes if deemed unsightly, or they can be left on the trees. As the spray will kill but few of the eggs, it is necessary to do the spraying before the female emerges and deposits them. If this has not been done, and the trunks are sprayed as the young larvæ hatch, every one of them will be destroyed. At a certain time the trunks of the trees infested with eggs will be covered with minute caterpillars. A practiced eye can tell just when this is occurring, as the egg-masses have a broken appearance and are pierced with holes when the larvæ have emerged and taken their first meal, perhaps. To spray the trunks then will destroy every larva touched.

I find that even if the cocoons are twenty or thirty deep on the branches the stiff spray will penetrate the entire mass. I have used these methods for the past twelve years and have found them effectual here as far as they could be carried out with a force of two men and one spraying machine for all our city parks. We use an extension pole devised for this purpose. The first pole is one and three-quarter inches in diameter and sixteen feet long. The second pole is one and one-fourth inches in diameter and eighteen feet long. The third is a bamboo pole bound to the top of the second one, and is eighteen feet long. The second pole has two rings or bands at its base to run up and down on the first, and is hoisted or lowered by a small rope and pulley. The hose is a quarter-inch orifice rubber-cloth insertion, which is strong and light.

Correspondence.

The Good Work of an Improvement Association at Narragansett Pier.

To the Editor of GARDEN AND FOREST:

Sir,—A few years ago Narragansett Pier presented the ragged, shiftless look which is only too common in American seaside resorts frequented by large numbers of people. Just beyond it to the southward ran a beautiful line of rocky coast, backed by the pastures rich in the sturdy shrubs and flowers characteristic of the south-eastern New England coast. But its hotels were built nearer to the fine bathing-beach, along a rough road, between which and the water lay neither beach nor real rocks—only a narrow stretch of stony shore, covered for the most part with rubbish and refuse; and back of them spread an unkempt little village. Now it shows few spots which are disagreeable to look upon; in many parts it has grown very pretty, and elsewhere it is neat, at least. Part of the improvement has been due to the building of the Casino between the hotels and the beach and to the excellent care bestowed from the first upon its grounds, and part to the macadamizing of streets and roads and to the increase in the number of private cottages and villas lying along the streets back from the sea. But even four or five years ago much raggedness and roughness were still apparent, and little care was taken to keep the highways in a tidy condition. The influential men among the hotel-owners and summer residents had tried to exert an influence toward the betterment of these conditions, but without much avail until they conceived the wise idea of asking the women also to exert themselves. A ladies' improvement association was formed, and, although it has existed only three or four years, the good it has accomplished is remarkable. Among its members are owners of summer cottages, constant frequenters of the hotels, and also native residents of the village. The annual fee has, for obvious reason, been kept at a low figure—two dollars; but voluntary contributions are welcome, and have more than once been generously made, and money-making entertainments have been organized from time to time. The largest outlay of the association has been a contribution of \$500 toward the building of a fine sea-wall along the ugly stretch of coast in front of the hotels. This, the most conspicuous improvement which could possibly have been made at the Pier, is now completed

for more than half its length. Each season a man is hired by the association, whose duty it is to patrol the streets and keep them clear of papers and rubbish; with this same end in view large strong baskets, painted green, have been attached to fences and posts at frequent intervals, and I have found these baskets constantly well filled with things which, but for their presence, would have littered up the roads and walks. But, say the members of the association, its greatest utility has been a moral one, as stimulating the individuals who belong to it, and, through their example, all the residents of the Pier to keep their private grounds more carefully and to adorn them with plantations. And certainly the combined results of its various efforts seem strikingly great to one who now revisits the Pier after an absence of several years.

Once there was scarcely a tree to be seen except a few Willows. Now very many have been planted, and the cottages are draped with Japanese Ivy, Wistaria, Rose-bushes and Honeysuckles, all of which grow luxuriantly in this climate. Japanese Roses are frequently seen, but it is a pleasure to notice that the common Wild Roses of the region are likewise profusely used for the decoration of the summer visitors' houses. Their grass, and that around the hotels also, is now beautifully kept; and, as a rule, a taste much more commendable than that generally revealed in such places has been shown in shunning so-called "ornamental beds," and trusting to trees, vines, climbers and shrubs for the beauty of small grounds. Privet-hedges are seen in numbers; no plant grows so quickly or does so well as Privet in situations of this sort; and just at this season, when even the most carefully clipped are bursting into profuse blossoming, it certainly supplies as charming a method of fencing villa grounds as could be found.

But the main thing to be noted in the change that has been so quickly worked in this summer resort is not the individual beauty of this plant or of that, or of these grounds or those, but the general improvement in the aspect of the village as a whole, and the fact that it results even more from the neatness newly achieved than from the plantations newly made. It should certainly encourage the formation of similar societies of women in all seashore places where they do not already exist.

Narragansett Pier.

M. G. Van Rensselaer.

Recent Publications.

Forest Management.—I.

A Manual of Forestry, by W. Schlich. iii. *Forest Management*. London: Bradbury, Agnew & Co. 1895.

The third volume of Dr. Schlich's *Manual of Forestry*, under the title of Forest Management, deals with the preparation of working plans and the gathering of information necessary to that end. The term "forest management," in this country at least, has been held to have a somewhat wider meaning than that attributed to it by Dr. Schlich, and has been taken to include the actual administration of forest-lands. In that sense the "management of a forest" is spoken of, or "forest management" is said to be introduced upon an area of woodland. While the construction and definition of forest terms in the English language is one of the most pressing needs of forestry at the present time, and while there is undoubtedly a gain in clearness under the new meaning, still it is questionable whether the use of the phrase under discussion has not been so firmly established as to make the change difficult, even at the suggestion of so high an authority as Dr. Schlich.

The reason at the root of the utility of a book like the present, which deals exclusively with the methods in use in countries whose conditions, as has been so often said, differ widely from those which obtain in the United States, is admirably described by Dr. Schlich in his preface. He says: "As I have stated elsewhere, the principles of forest management hold good all the world over. In endeavoring to explain these principles it seemed to be right and proper to be guided by the experience gained in those countries which have taken the lead in forestry, namely, Germany and France. In these countries systematic forest management became a necessity almost a hundred years ago, so that their methods are now based upon long experience and a rich crop of investigations."

As a general statement the paragraph just quoted is entirely beyond dispute, and in a text-book for English

students it is unquestionably in its place. But even some of the more rigorous principles of forest management, as they are accepted elsewhere, may need modification when they come to be applied in the United States. An example occurs further on in the preface, where Dr. Schlich says: "Economic forestry, to be successful, must be conducted on true sylvicultural principles, and the yield must be so regulated, that, approximately, the same quantity of material may be brought into the market every year; in other words, the principle of a sustained and well-regulated yield must be recognized. Then, and then only, can adequate financial results be expected from forestry." In its application to countries where transportation is less developed and freights are more expensive than in the United States, no exception could well be taken to what Dr. Schlich has said. But with us, where the utilizable part of the wood standing in the forest is usually a comparatively small per cent. of the whole, and where the market of an owner of woodlands in the Alleghany region may cover all the territory from Boston to New Orleans, the reasons for a sustained annual yield lose much of their importance, and in some cases may almost be said to disappear. The single reason which would remain in many instances, were forest management to be applied, would be the necessity for giving continuous work to a trained nucleus for a forest force. Although Dr. Schlich qualifies his original statement when he elaborates it on pages 173-177, in discussing the principles of forest working plans, it still remains true that in many cases, under current economic conditions in the United States, profitable and conservative forest management would not imply anything which could properly be described as a sustained annual yield, and, consequently, would fall outside the definition which the author has given it.

The volume under review is an excellent résumé of the present conditions of one department of forestry in Europe. Concise, systematic, simple in statement and comprehensive in the sense of wise selection, it takes a place which has hitherto been unoccupied. There is nothing else in the same field in English which deserves rank beside it. The criticisms which may be made upon it are to be directed in very great proportion not upon Dr. Schlich's work, but upon the general condition of the science which it summarizes. One of these is called to mind by the fact that, on p. 34, Dr. Schlich rates the proportion of bark, which varies with species, age and locality, at from six to twenty per cent. of the total volume of the tree. Yet, in the calculations made for the purpose of determining the amount of wood standing on any piece of land, and in the yield tables which have been prepared to facilitate it, no allowance is usually made for the bark, while differences of two or three per cent. in the result of the methods used are quoted as matters worthy of attention.

While Dr. Schlich's book is, as I have already said, a summary of the position of one part of the science of forestry in Europe, and more especially in Germany, it is yet written distinctly from the position of one who reserves the right to criticise things as they are. It is predominantly and most successfully a text-book, but it contains here and there discussions of inadequate or imperfect instruments and methods such as are more often found in general treatises. Their value in this place will be to induce the student to think for himself. On the other hand, the details of the methods of working are given with a precision altogether German, and, indeed, the whole book is as thoroughly German as is Dr. Schlich himself.

New York.

Gifford Pinchot.

Notes.

Some of last season's sweet-potatoes are still offered in this city at \$1.00 a peck.

The area of the land devoted to the cultivation of prunes in Oregon, Washington and Idaho is already some 50,000 acres.

To exemplify the rapidity with which the Eucalyptus-tree grows in California, a recent writer in the *Scientific American*

says that at New Jerusalem, in that state, one of his neighbors not long ago chopped down a Eucalyptus which he had himself planted nineteen years before. The tree yielded four cords of stove-wood, and it had measured sixty-three feet in height, twelve feet three inches in circumference at the base, and eight feet nine inches at eight feet above the ground.

The grounds of the Berlin Industrial Exhibition, to be held during the summer of 1896, will, it is promised, be exceptionally attractive. Their chief feature will be a large lake formed by the flooding of the present great playgrounds of Treptow Park. A promenade shaded by four rows of Plane-trees now encircles the playground and will form an admirable border for the lake, to create which 48,000 cubic metres of earth must be removed. The water will be pumped up to heights overhanging the lake, whence it will fall into it by means of fine cascades, finally flowing off into the river Spree. But the most interesting feature of the scheme is that the city authorities have stipulated that, when the exhibition is over, the playgrounds must be restored to their original condition, which will necessitate among other things the storing away of the 24,000 square yards of sod which now cover them.

Blackberries are such strong-growing plants that they need a good deal of moisture, and, therefore, the field where they are set should be plowed and subsoiled to a depth of, at least, twenty inches, and every clod should be broken very fine, so that when the ground settles compactly it will hold a great deal of water. *The North American Horticulturist* points out that it is a great mistake to leave off cultivation as soon as the berry season is over, since the pickers will tramp the ground hard, so that the water will evaporate quickly from the soil and the plants will at once ripen up their wood. With the fall rains a new growth will begin, which, of course, will be green and sappy, and unable to endure a hard winter. The best practice is to give frequent and shallow cultivation from early spring until the middle of August or the first of September.

The July number of *The Journal of Botany* contains a biographical notice, from the pen of Sir Joseph Hooker, of Dr. David Lyall, who was surgeon on one of the English men-of-war which, under Sir James Ross, explored antarctic regions from 1839 to 1842. Dr. Lyall died last March, in his seventyninth year, after a long service as medical officer and naturalist in the navy. Thirty years ago he was surgeon to the Land Boundary Commission, under Sir John Hawkins, that surveyed the boundary line between British Columbia and the United States. It was on this expedition that he discovered the rare alpine Larch-tree bearing his name, which is thus made familiar to students of American trees. The scientific results obtained by Dr. Lyall on this expedition are published in an important paper in the seventh volume of the *Journal of the Linnaean Society*. This contains an excellent botanical account of the regions between the coast and altitudes of eight thousand feet in the Rocky Mountains, in which the various zones of vegetation in British Columbia are indicated and scientifically portrayed.

The forty-seventh volume of *The Garden* is dedicated to Edouard F. André, the distinguished French landscape-gardener and the editor of the *Revue Horticole*. The dedication, which is accompanied by a portrait, contains an interesting sketch of his useful and laborious career, setting forth in detail the vast amount of scientific, literary and artistic work which Monsieur André, who has only just passed his fifty-fifth year, has already accomplished. A practical horticulturist who for several years directed the horticultural works of the city of Paris, an accomplished scientific traveler in tropical regions that before his time were practically unknown to the botanist, an excellent botanist with an unrivaled knowledge of cultivated plants, a designer of most of the important parks, public and private, that have been created in Europe during the last thirty years, an excellent and faithful journalist, Monsieur André has distinguished himself in all these varied fields of intellectual and physical activity. Still as energetic as ever in the development of his artistic and scientific career, and with every prospect of many more years of usefulness before him, it is pleasant to know that his eldest son, a distinguished engineer, is following faithfully and successfully in his father's artistic profession.

Experiments have shown that mild currents of electricity may have a beneficial effect on the growth of plants, but, of course, a heavy charge will kill a plant just as lightning will kill a tree. Professor Dolbear, in the current number of *The Cosmopolitan*, says that this quality of the electric currents has been used to destroy weeds that grow by railroad-tracks and on adjacent embankments. Without explaining the apparatus

particularly, it is said that a metallic strip behind the car stretching across the track a short distance above the ground, is provided with many fine wires, which hang from it like the loose teeth of a rake. Through these teeth the electricity is discharged as the car moves forward, and every weed touched by a live wire receives a deadly current which traverses the roots to their very tips and kills the plant outright. Very evidently a similar plan can be used for ridding cultivated fields of Daisies, Chicory or other plants when their stems reach above the grass about them. A two-wheeled vehicle, like a horse hay-rake, carrying a battery, could be driven across a field so as to kill every plant with which the metallic conductor should come in contact. In this way acres of valuable land could be rid of coarse weeds in a day, with the assurance that no plant fairly struck would ever start into life again.

In the fifty car-loads of California fruits sold here last week were Egg, Columbia, Quackenbos, Magnum Bonum, Bradshaw, Burbank and Bulgarian plums. Peaches from California are as yet neither plentiful nor showy. Nectarines from the Pacific slope sell for \$2.00 to \$2.50 a crate, wholesale, and the best Bartlett pears average \$2.00 a box. Large quantities of peaches continue to come from Georgia, as many as sixty-two car-loads reaching this market in two days. The best peaches now seen here are some large and handsome Elbertas from that state. Troth, York and Rivers peaches are already here from Maryland and Delaware, and a few premature ones from New Jersey. There has been a glut of apples and pears owing to the shipment of large quantities of windfalls and immature fruit, and prices for choice hand-picked apples and pears have suffered in consequence. Summer pippins of the highest grade have brought but \$1.25 to \$1.50 a barrel at wholesale, and Red Astrachans but sixty cents a crate. Le Conte, Bartlett, Jargonelle, Catherine and Bell pears are abundant, and cost from seventy-five cents to \$2.00 a barrel. Moore's Early grapes from the Carolinas sell for fifteen cents a pound at retail, fancy Delawares commanding higher prices. No grapes from California are yet in the market, although a small shipment of a seedless grape known as the Coverley was sent from Palm Springs about the middle of July. This is a little tropical valley on the edge of the great Colorado desert, about one hundred miles east of Los Angeles, and the grape is small, sweet and firm enough to bear transportation well. It grows in large clusters and makes a fine appearance, and a recent dispatch to the *New York Tribune* says that it is rapidly coming into favor as an early market grape in southern California. Red and black currants, raspberries, blackberries and huckleberries are abundant, and cost from ten to fifteen cents a quart.

One of the most famous of the beautiful Renaissance villas of Italy is the Villa Lante, which stands about two miles northeast of Viterbo, on the edge of a village called Bagnaia. Fortunately, it is always accessible to visitors, for, says a recent writer, it is "the one in which the best qualities of all the others are united in a faultless whole," and its gardens are in a better state of preservation than is often the case. "The approach," we are told, "is up a narrow, dingy street, which ends at the entrance to the villa. The latter is comparatively small and is built on an incline which is a continuation of the grade of the street. In the centre of the first level a bronze fountain with four upright male figures plays in the middle of a square marble basin. The garden surrounding it, which is itself inclosed by tall hedges, is of the same proportions as the basin. From this level, two ramps, built in the approved Roman fashion, ascend to another on which stood the two little palaces of the estate, both alike and placed one at either side, say, a hundred and fifty, perhaps two hundred, feet of ground between. On the terrace that occupies this central space, a semicircular fountain in three stages abuts, and on either side staircases lead higher up. Another fountain is discovered on this second terrace, another appears on the third, still another adorns the fourth, and, finally, at the top, a wide basin with fountains above it reveals the source of the sparkling water that goes merrily down to the bronzes. It does not go through subterranean passages or through prosaic pipes. It flows from fountain to fountain through richly wrought stone channels; it falls from one basin to another, and what you see as you stand beside the highest of these many receptacles is a perfect arabesque of hoary stone with countless jets of silvery water gleaming in the sun. You see a succession of steps, inclines, balustrades and urns, all heavily decorated, all covered with flowers and vines, all shadowed, in spite of the sun, by magnificent Oaks, descending with indescribable pomp to the gateway far below. No words could picture the lovely scene."

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLES:—Doing Too Much.—II.....	311
Abolition of the Government Seed Bureau	311
The Collection of Funeral Wreaths and Offerings in the Museum of Egyptian Antiquities at Giseh.....	<i>Anna Murray Vail.</i> 312
FOREIGN CORRESPONDENCE:—London Letter.....	<i>W. Watson.</i> 313
ENTOMOLOGICAL:—The White-marked Tussock Moth, <i>Orygia leucostigma</i> , in Western New York. (With figure.).....	<i>Victor H. Lowe.</i> 314
NEW OR LITTLE-KNOWN PLANTS:— <i>Kalmia latifolia</i> , var. <i>myrtifolia</i> . (With figure.).....	315
PLANT NOTES.....	315
CULTURAL DEPARTMENT:—Hardy Perennials.....	<i>R. Cameron.</i> 316
Some July Flowers.....	<i>W. E. Endicott.</i> 316
The Gladiolus.....	<i>F. N. Gerard.</i> 317
Notes on Onions.....	<i>William Scott.</i> 318
Peas, Strawberries.....	<i>T. D. Hatfield.</i> 318
CORRESPONDENCE:—Plant-breeding.....	<i>Professor L. H. Bailey.</i> 318
Rhododendrons in a Hard Winter.....	<i>Frederick W. Kelsey.</i> 319
RECENT PUBLICATIONS.....	319
NOTES	319
ILLUSTRATIONS:—The White-marked Tussock Moth, <i>Orygia leucostigma</i> , Fig. 43.	315
<i>Kalmia latifolia</i> , var. <i>myrtifolia</i> , Fig. 44.....	317

Doing Too Much.—II.

WE spoke recently of the tendency to do too much as one of the errors in our treatment of country places, especially those of small size. Our former carelessness in regard to architectural beauty was succeeded by a period when we believed that it meant as much ornamentation as possible. This belief we are outgrowing. In architecture we are beginning to realize that the highest beauty most often means simplicity, and always means fitness, but in gardening we are still in the second period. We think too much of elaboration in our small grounds, and too little of appropriateness as regards their adaptation either to the house they surround or to the original character and natural possibilities of the site itself.

When, as is often the case in our more populous summer colonies, cottages and villas for summer residence exist in such numbers that they form actual streets, each house being surrounded by only a small piece of ground, and views of the adjacent country being cut off, then it is proper to treat these grounds as gardens. They may rightly be designed and planted in truly gardenesque ways, and filled as full of beautiful plants of all kinds as is consistent with good taste and the depth of the owner's purse. But even under these conditions it is too often thought that the purse must be deeply drawn upon to get an agreeable result, while good taste is constantly outraged by overcrowding, and also by the selection, for their rarity, or, at least, for their individual charms, of plants which do not combine into an harmonious whole.

Overcrowding is, indeed, an almost universal sin in our small grounds. Perhaps, when the house was built it stood in the midst of a bare expanse, unpleasantly naked in its own effect, and with its windows and piazzas unpleasantly open to the public eye; therefore, trees are set out in sufficient numbers to afford shade and protection quickly, vines and shrubs are started to clothe the crude foundations and partially screen the piazzas, and flowers are planted to enliven the general effect and furnish supplies for cutting for the house. At first it does not seem that too much had been done, but even if nothing further is done, in a few years, if climate and soil are not very unpropitious, unless some of the trees are cut

out they will crowd one another to their common injury, exclude light and air from the dwelling, and utterly shut off the view of any world beyond the borders of the small property itself. Unthinned, the shrubs will grow into thickets, which no amount of pruning will keep in an attractive condition; they will lose their lower branches and they will not bloom as prolifically as they should. And, unless carefully checked and directed, the vines will so swathe the house as to conceal its architectural character entirely, prevent sunshine and breezes from refreshing its piazzas, and assist the trees to darken all parts of it.

This is the condition of many of the cottages of people who inhabit them only during the summer; and, unfortunately, this is the condition which seems just now to excite admiration most surely. The passer-by pronounces it picturesque and cozy, and so thinks the owner, grown accustomed to excessive luxuriance, to confusion of effect, and to the lack of fresh air and sunshine. The natural pride which every planter takes in the successful development of his nurslings is allowed to become an unnatural distaste to using the axe and the shears upon them. The overshadowed cottage and the overcrowded place are becoming as typical of our summer resorts as were once the wholly naked house and the almost wholly neglected grounds. And when to this general liking for as much foliage as possible is added a special taste for brilliant flowers or for showy exotic plants, then excessive want of harmony is added to excessive luxuriance, and the result is still worse.

A really good effect can be obtained in places of this sort only when constant study is given to their development, and this study is more needed in taking care of a small place than in planting it. Errors in planting on a small scale may be retrieved if a careful eye is kept on the progress of the place, and they are soon detected; but the very best original scheme is surely and quickly injured if overcrowding is permitted to go on for any considerable period. And if thinning is then attempted, all the remaining trees and shrubs and vines will present, for a long time, an unattractive appearance, while many of them will be irretrievably ruined.

The owner should realize from the first just what it is that he wants of his plantations—how much shade and how much sunshine he desires for the house itself and for other parts of his little property; in what degree he wishes to be shut off from the street and from his neighbors; how much of his house, and just what portions of it, he would like to see garmented with vines, and just what portions he prefers to keep free from them, so that its best architectural points shall remain apparent and its solidity as a whole shall not seem to be impaired; in how great a measure he wishes his piazza screened by these vines or by the shrubs planted at its base, and in how great a measure left open to the breezes and the sun. When he understands what he wants, all his plantations should be carefully watched from year to year and encouraged or checked, in correspondence with his plan. And, of course, when he owns a particularly fine tree or a particularly attractive flowering shrub or group of shrubs, he should consider its individual claims as tenderly as he can, without detriment to the general effect of his place, and not allow it to be spoiled by intrusive neighbors less valuable than itself. In short, he should not fear to use axe or shears any more than he fears to use the implements of planting. He should remember that his grounds exist for him as truly as his house does. But too often he seems to think that he exists for them, and has no right to protest, no matter how overluxuriant may be the vegetation they produce. And, by virtue of this well-intentioned mistake, he deprives his place of that greatest of all artistic merits—simplicity.

MORE than fifty years ago the Commissioner of Patents was authorized to purchase and distribute—under a specific appropriation—seeds of new plants which could prob-

ably be grown with profit in this country. By a loose interpretation of this law this free-seed dispensation expanded until the mails were annually burdened with packages by the million, weighing in the aggregate hundreds of tons, and sufficient to plant something like a hundred thousand acres of flower and kitchen garden. Not only were seeds of the commonest vegetable and flowering plants sent out in this way, but in many cases worthless seeds were used which had been paid for at extravagant prices. Just before he resigned his position as Attorney-General, Mr. Olney delivered an opinion to the effect that the phrase "new and valuable seeds, rare and uncommon to the country," cannot be construed to mean the ordinary market varieties of Turnips and Cabbages, or of China Aster and Nasturtiums. Under this ruling the Secretary of Agriculture is prohibited from purchasing any seed which is not plainly included in the original intent of the law. Of course, the expenditure of this money by the Seed Division has been denounced year after year by every intelligent organ of public opinion in the country as a worse than useless extravagance, and if Mr. Olney's opinion is correct, it has been illegal also. In spite of the fact that the abolition of this Seed Bureau will save the country \$200,000 a year, an effort will be made by certain Congressmen to reorganize it by special enactment and set it running again. What Congress should do is to prohibit entirely the purchase of seeds of any kind for general distribution by the Department of Agriculture. There is no danger that this country will suffer for any lack of plants, either for ornament or use. Private enterprise can be trusted to secure and disseminate seeds or bulbs, or roots or cuttings of every tree or shrub or herb which we do not now possess, and which promises to be of any horticultural or agricultural value.

The Collection of Funeral Wreaths and Offerings in the Museum of Egyptian Antiquities at Giseh.

ABOUT two miles from Cairo, over a dusty road, shaded by equally dusty and parched, but picturesque rows of that almost only Egyptian shade-tree, the Lebbek (*Albizia Lebbek*), facing the Nile and surrounded by very indifferently kept, tropical, high-walled gardens, is the large suburban palace of the late Khedive, Ismail Pasha. In it is housed, since 1890, the enormous collection of Egyptian antiquities that for some thirty years or more has been known as the Boulaq Museum. It is a dreary building and eminently unfitted for the use to which it is now put. Anything more incongruous can scarcely be imagined than the very fantastic imitation-roccoco decoration in the interior, and the endless rows of silent and stately gods and goddesses, kings and priests that gaze in stony wonder at the nondescript pink, blue, white and gilt stucco of the very worst period of Franco-Turkish ornamentation.

The special collection in question is very small, but is probably the oldest botanical one in the world, as the bulk of the specimens come from the coffins of the royal mummies found secreted in the side of the mountain of Deir-el-Bahari, in the necropolis of Thebes, in 1881. It consists of a few mounted and framed flowers on the walls, a glass case of funeral wreaths, two more containing small earthenware bowls filled with cereals and fruits, and some very ancient and desiccated-looking logs leaning against the walls. It has been arranged and classified by Dr. G. Schweinfurth, the eminent oriental botanist, and many of the specimens are more than thirty centuries old.

The most interesting of the specimens on the walls are those of the Water-lilies. They are very frail and brownish, but the hot, dry atmosphere of the rock-hewn tombs where they were found has preserved their shape and character to such a degree that they look scarcely more aged than many a plant of the same species collected and preserved within very recent years for herbarium purposes. The White Lotus, *Nymphaea Lotus*, is the best known of the Egyptian species, and is often represented on the monu-

ments with all the details of the plant faithfully rendered; it is known to have been in Egypt from the time of the erection of the Great Pyramids. The flowers have been very frequently found in the tombs, either as parts of garlands or entirely decorating mummies, and it was in general use, especially during the Ramesside period, for all sorts of purposes. Immense bouquets and garlands of it were used for decoration on festal days. Women carried them in their hands or arranged them on their head-dresses, the stems coiled diadem-fashion, with the flowers falling over the forehead. The tuberous roots were used as food, even the seeds were eaten; its medical uses were known in the ancient Egyptian pharmacopœia, and what is interesting to us is that the Egyptian name of the flower, *Soushin*, meaning "Lily," has come down to us through various philosophical changes. Few of those who bear the name of Susan are aware of its meaning or of its remote antiquity. There are records of women of that name as far back as the Twelfth Dynasty, 2466, B. C., and even men in the time of the Pharoahs were known to have borne it. The White Lotus is still found occasionally in Egypt, in a few stagnant canals and in pools and ponds left after the inundation of the Nile; but it has vanished from the life of the people.

The Blue Lotus, *Nymphaea caerulea*, exists also in the Giseh herbarium, and enters into the composition of a small garland consisting of Celery-branches, *Apium graveolens*, intermingled with the Lily-petals and those of a smaller *Nymphaea* that has not been identified with any species known in our time. It is less often found than the White Lotus, but occurs as garlands around the necks of painted personages in some very ancient tombs. It also enters into the composition of the decorations put on the mummy of the Great Ramses II. many years after his death, and is said still to exist in Egypt.

Papyrus, *Cyperus Papyrus*, is often found, usually the stems, with the radiating head, laid in the hands of the mummies. It is no longer seen wild in Egypt, though in Abyssinia, Nubia, Syria and Asia Minor it grows spontaneously and forms impenetrable thickets on the river-banks. Its many uses are too well known to enumerate here. The wreaths that covered the mummy of Ramses II., 1333, B. C., are long, slender garlands of Willow-leaves, doubled and sewed together with Date Palm fibre around a twisted cord of the same material, interspersed here and there with single petals of the Blue and of the White Lotus. The Willow, *Salix Safsaf*, is a low shrub still to be seen on the banks of the Nile, and its leaves are the basis of most of the funeral garlands that have come to light. It was the sacred tree of the classical Tentyra or Tentyris, where the Temple of Hathor, at Denderah, now stands, and one of the religious ceremonies of the time, performed by the king, was the erection of a Willow before the image of the goddess.

Other garlands are woven of the Willow and single petals of *Alcea ficifolia*, a Malvaceous plant, which is still cultivated in some old Arabic gardens; others have the *Salix*-leaves, with scattered here and there the little, round, fluffy balls of *Acacia Nilotica*, the Shant-tree of ancient writers, and the source of the gum arabic of commerce, an odorous shrub that to-day grows in profusion along the river, and in early spring fills the island of Philæ with its delicious fragrance. Other wreaths, again, are woven of a species of *Mimusops*, supposed to be the *Persea* of antiquity, the specific name of which is a matter of disagreement. The garlands taken from the mummy of King Ahmès I., 1700, B. C., were made of Willow, *Acacia*, *Alcea* and the yellow leguminous flowers of *Sesbania Aegyptica*, and in his coffin were found smaller ones constructed of the blue-purple flowers of *Delphinium orientale*, a Larkspur that after three thousand years still retains traces of its color. The latter plant is not known in the Egypt of to-day. Another interesting garland is that found in the coffin of the Princess Nesi-Khonsou, and is composed of the usual Willow and many Poppy-flowers, and faint markings of red color are

still on the somewhat shriveled petals. It is common now, especially near Alexandria, where it fills the grain-fields and covers the canal and railroad embankments with a profusion of brilliant scarlet, and is the type and ancestor of the gay Field Poppy so plentiful all over Europe. It is called by Boissier *Papaver Rhoeas*, var. *genuinum*.

The coffin of King Amenophis, the builder of the Memnon statues, and dating from many years before that of Ramses, was decorated with similar wreaths, some of which still surround the uncovered mummy in the big hall where the royal mummies are preserved, and tends to show the remote date of the origin of the custom of decorating the dead with flowers.

Many interesting plant-remains were found in the coffin of a private personage named Quent, and among others the space between it and the lid was entirely filled with branches of the Sycamore-tree, *Ficus Sycomorus*, that still retained their leaves. The latter was a valuable and important tree and supplied some of the material for the mummy cases, many of which, after three thousand years, are still in a state of perfect preservation. It was used for furniture, and many statues carved in its enduring wood have come down to us from the early Dynasties, and it is still a common tree everywhere in the country and the largest of the shade-trees. The abundant small fruit is used by the lower classes and is hawked in the streets of Cairo. There is also a bowlful of the fruit of the Fig-tree proper, *Ficus Carica*, at Giseh, and mixed with it are some dates, all taken from funeral offerings. The Date-Palms, *Phoenix dactylifera*, are the most abundant, and oftentimes the only trees on the Nile, and its diceous character was known to the ancients, for hieroglyphic texts speak of it, and in his history Herodotus makes mention of the festival when the trees were artificially fertilized, though curiously enough they called the fertile one the Male Palm. The leaf-rachis was used then, as it is now, for the manufacture of all sorts of useful utensils, chair-seats, bird-cages, mats, sun-shelters, etc.

The large nut of the Doum, *Hyphaene Thebaica*, has also been collected from the tombs. It is the Palm with broad, fan-shaped leaves that is seen everywhere in upper Egypt. The fellahs say that the fruit is edible when young, though when ripe it is so hard that it can only be split with a hatchet.

Of the cereals, Wheat, *Triticum vulgare*, is the most interesting of the exhibit, as well as the one that is most frequently found in large quantities. Almost any traveler can secure a little jar of it, genuine "antica," at the necropolis of Thebes, and during the excavations conducted by Monsieur Naville at the temple of Queen Hatasu, at Deir-el-Bahari, in 1893, it was lying in his office by the basketful. The ancient Egyptians, for the better preservation of the wheat, which was supposed to be deposited in the tomb for the nourishment of the soul of the deceased, were in the habit of varnishing the grains with some kind of resinous substance. Egyptian wheat, after a drying period of over three thousand years, has been sown by some credulous folk—without success, however.

A curious find were the bowlsful of a Lichen, *Parmelia furfuracea*, found with the royal mummies. It was noticed by the botanist Forskål more than a century ago in the markets of Cairo, and he wrote a lengthy description of how, mixed with flour, it caused fermentation. It comes from the Greek Archipelago, and under the name of Chèba is sold in the drug bazaar of Cairo to-day. Perchance the ancients used it for the same purpose, and, therefore, the reason of its frequent occurrence among their offerings.

To return to the Water-lilies, it is strange that the Sacred Lotus, the classical flower that Herodotus calls the Rose-like Lily of the Nile, *Nelumbium speciosum*, has not been found. It was very sacred and worshiped almost as a divinity, and it was forbidden to eat its fruit. It is represented on some monuments, though with such fantastic deviations from nature that it is scarcely recognizable. They are cultivated in Cairo and elsewhere in the Delta,

in private gardens, where they thrive without any special care or cultivation being given them.

That they are easy plants to grow is demonstrated in this city, where, in most of the fountains, they are to be seen during the summer months, along with the Papyrus and many species of *Nymphaeas*, and at the proper season a small pond on the west side of Central Park is filled with the great rose-colored flowers that stand proudly two or more feet above the water.

It would take too long to go through the entire list of plant-remains that have been brought together from various sources. Egypt is by no means entirely explored yet, and its early inhabitants having a very creditable way of writing everything they knew or owned on imperishable stone, and of preserving everything that would resist decay, there is no reason that knowledge of the greater portion of their botanical and pharmaceutical possessions may not yet come to light. Monsieur Victor Loret, in *La Flore Pharaonique* enumerates 202 species with their ancient as well as modern names, and Mr. Perry Newberry, of Kew Gardens, has already spent many months in Egypt identifying the vegetable remains found by Mr. Flinders-Petrie at Hawara, Dashour and in the Græco-Roman necropolis in the Fayoum.

New York.

Anna Murray Vail.

Foreign Correspondence.

London Letter.

SOME notes on the most attractive herbaceous plants now flowering in the open air at Kew may be of interest to readers of GARDEN AND FOREST. A collection which comprises in round numbers 6,000 species of herbaceous and alpine plants capable of cultivation in the open air necessarily contains numerous plants which are worthy the attention of horticulturists, but which are not generally grown in gardens, but the middle of July, after a season of exceptional drought, is not, perhaps, the most favorable time to see them. I have, however, jotted down the names of some of the handsomest of the plants now in flower in the borders and rock garden, and every one of these is well worthy of a place among select collections of garden-plants. The difference in stature and in size and color of flower between plants of the same kind grown in good soil and well watered and those grown in the natural soil of the place and watered now and then is most marked. Certainly all herbaceous plants require good cultivation, and, although they will grow and flower under starvation treatment, they are, as a rule, miserable caricatures of what liberal treatment will produce. Delphiniums, well treated here, are now eight feet high and magnificent; poorly treated, they are barely four feet high. This is equally true of most plants, even Poppies showing the same marked preference for rich soil. There are, however, two noteworthy exceptions in the Verbascums and single Hollyhocks, which are taller and handsomer on poor soil than on rich. I believe manure to be the principal cause of disease in the Hollyhock. Other plants which have done well in somewhat dry positions and where the soil is not rich are Lychnis Chalcedonica, three feet high, with crimson heads four inches across; Achillea ptarmica, the Pearl, three feet high; Geranium armenum and Spiraea Aruncus.

CAMpanulas.—The best of these is *Campanula persicifolia* in all its forms, especially the large pure white variety called *grandiflora*. They have been in flower a month at least, and they are still beautiful. Being a perennial and quite hardy, this is a most useful plant for open-air gardening; it is equally useful when grown in pots in a cold frame to flower in spring in the conservatory. *C. rapunculoides* has stems four feet high crowded with rich purple-blue bells.

CHRYSANTHEMUMS of the Paris Daisy section are too well known to require more than passing notice. There is, however, a robust form of the yellow Marguerite, called *Etoile d'Or major*, the correct name of which is *C. frutes-*

cens, var. chrysaster, and it is a great improvement upon the older variety, the plant being much more robust and the heads fully two inches across. *C. maximum* is a most attractive summer bedding-plant.

COREOPSIS OR CALIOPSIS.—The best of this genus are two forms of *Coreopsis tinctoria* named *atrosanguinea* and *bicolor*. They grow about eighteen inches high, the former having rich maroon-crimson flowers, the latter deep yellow, with a large maroon centre. The Texan *C. Drummondii* is almost as ornamental, but its flowers are nearly all yellow and its leaves are less elegant.

DELPHINIUM.—One of the most admired of all the species of this genus is the Siberian *Delphinium grandiflorum*, which grows to a height of eighteen inches or two feet, and has slender stems with feathery leaves and the richest gentian-blue flowers. It is said to be one of the parents of the fine border *Delphiniums*. It flowers freely the first year from seeds. All the varieties of *D. Ajacis* are worth growing, their height being from three to five feet and their flowers in loose large panicles. They are annuals, and are easily raised from seeds.

ERYNGIUMS.—The best of these are *Eryngium alpinum*, with leafy stems a yard high and whorls of large involucral bracts of a rich steel-blue color; *E. Oliverianum*, equally handsome, and not unlike *E. alpinum* in color, and *E. giganteum*, which has milk-white bracts, and is one of the happiest in the ordinary border. These plants should be raised from seeds sown in pots and grown on in a frame the first year. There are numerous other species and varieties deserving of a place in gardens, but they are not in flower now.

PHACELIA CAMPANULARIA is one of the most beautiful of Californian annuals, and it is a good plant for dry situations. Here it has been greatly admired in beds on the lawn, where it is sown over bulbous Irises to furnish the beds in summer.

BRACHYCOME IBERIDIFOLIA, the Swan River Daisy, is a charming annual when sown in large patches near the front of the border, where it forms a tuft a yard through and a foot high of hair-like stems bearing bright blue daisy-like flowers an inch across.

CENTAUREA CYNAROIDES is one of the best of the exotic Knap weeds, and, although a native of the Canary Islands, is hardy here. Its stems are two feet high, the leaves are deeply pinnatifid, a foot long, dark green, with a pale midrib, and the flower-heads are large and of a bright mauve color. If our native Corn-flower, *C. Cyanus*, is not generally grown in America, I can strongly recommend it as a suitable companion for the Sweet Sultan, *C. moschata*, both for the open border and in the greenhouse in spring.

SALVIA HORMINUM, the purple Clary, is attractive on account of the rich purple-blue leaf-like bracts borne at the apex of the flower-spike. It is of the easiest culture and should be in every herbaceous border. *Salvia virgata* is ornamental in the color of its calyces, which clothe the long erect spikes and are a bright red-purple. In the twilight this plant has a rich glow. It grows to a height of four feet and has small blue flowers.

MALVA.—All the Mallows are ornamental, but there is a specially handsome one in flower here now named *Malva Alcea*, var. *fastigiata*. It is five feet high, well branched, forming a broad bush, crowded with bright mauve-pink flowers two inches across. It is quite hardy and perennial.

NIGELLA DAMASCENA, the Fennel Flower, is a strikingly handsome annual, with stems, leaves, flowers and fruits which suggest spider's webs in their elegance and arrangement. The flowers are star-shaped, nearly two inches across, pale blue, and the Poppy-like fruits are crowned with a whorl of horns suggestive of long spiders' legs.

LYNCHNIS CÆLI-ROSEA is a beautiful little annual Campion, a foot high, with Linum-like pale purple flowers, and the variety *elegans* has flowers of a rich, glowing crimson color. The latter is an exceptionally fine thing for the border.

ONONIS, or Rest Harrow, is common in some parts of

England, but some of the species are worth a place in the garden; for instance, *O. rotundifolia* and *O. repens*, as they form compact little bushes and flower freely during the early part of summer.

CENTRANTHUS RUBER and **C. MACROSIPHON**, two of the best of the Valerians, are beautiful in the garden and magnificent on chalky soil. This year they have done well, the heads of flowers being large and bright in color. In Phœnix Park, Dublin, *C. ruber* has taken almost entire possession of a large rock-garden, and when in flower it is like a cloud of bright red. Along the railways running through the chalk downs in the south of England, it is also very abundant, and when in flower in summer it astonishes travelers unacquainted with its beauty.

I might also include such plants as *Helenium pumilum*, *Iberis umbellata* Empress and *carnea*, the stately *Bocconia cordata* and *Lathyrus rotundifolius*, the early Dahlias and summer-flowering Chrysanthemums, which contribute largely to the charm of our gardens in July. Many of these are old acquaintances, but they are often overlooked even by experienced horticulturists, and a reminder of them is often welcome.

London.

W. Watson.

Entomological.

The White-marked Tussock Moth, *Orgyia leuco-stigma*, in Western New York.

NUMEROUS complaints concerning the depredations of this insect in Apple-orchards have recently come from fruit-growers in the western part of the state, especially from Yates and Ontario counties. One fruit-grower in this vicinity reports that twenty-five per cent. of his apple crop has been ruined this year by this insect. The injury is done by the caterpillars alone, which feed not only upon the foliage but on the young apples as well. They gnaw into the sides of the apples, thus causing them to become withered and deformed.

This destructive caterpillar is very striking in appearance. It is quite slender and covered with hairs of various lengths and colors. The prevailing color is bright yellow. The head and two tubercle-like projections on the back are coral-red. The four tufts of hair on the back are white. The two long plumes in front and the one at the posterior extremity are black. A broad black stripe runs the full length of the back, and on each side is a broader dark brown or black one. Along the sides, arranged in two rows, are numerous yellow tubercles, from which radiate pale yellow hairs.

The adult insect is a moth. The female is wingless, light gray in color, and if examined soon after she emerges from her cocoon will be found greatly distended with eggs. The males are provided with four dark brown wings, marked with a few dark wavy lines and a white spot on the inner angle of each anterior wing. Not being able to fly, the female clings to the outside of her cocoon, upon which she deposits her eggs, fastening them in place by a gelatinous frothy mass, which soon becomes hard and brittle. Usually one or two dead leaves will be found sticking to the mass. According to Mr. Saunders, a single female will deposit from 300 to 500 eggs in one of these masses.

It is in this state that the insect passes the winter, the eggs lying dormant until about the middle of May or first of June, when the young caterpillars are hatched. They quickly spread to various parts of the tree, feeding voraciously on the under sides of the leaves, and, as above noted, frequently upon the young apples as well. This brood completes its transformation about the first of August, and the second brood before the cold winter weather sets in.

When the caterpillars are established in an orchard, jarring the trees is recommended. Mr. C. K. Scoon, of Geneva, New York, who found them abundant in his Plum-orchard last year, kept them in check by frequently jarring the trees by a succession of light taps. The caterpillars at first hang suspended by a silk thread, but the repeated

jars cause them to fall to the ground; or, better yet, a curculio cart may be placed in position where they could be easily captured and killed. In case the curculio carts are not to be had, any large sheet spread on the ground under the tree will answer the purpose.

During the winter a very careful search should be made for the egg masses, which, as above noted, will be found attached to the empty cocoons which were formerly inhabited by the females. The eggs may be destroyed by crushing.

Spraying with the arsenites is also recommended, although the grower referred to as losing a considerable portion of his apple crop says that he sprayed his orchard three times with Paris green, but apparently to no effect. This failure may have been due to a lack of lime in the mixture, as an excess of lime has a tendency to make the poison remain on the leaves. The spraying should be done very thoroughly, care being taken to drench the under surface of every leaf. The caterpillars are said to be more susceptible to the poison when young.

According to Dr. Lintner, this insect is widely distributed in the United States, being found both north and south as far west as the Rocky Mountains. It has a large variety of food-plants, but, according to Mr. Saunders, prefers the Apple. It is known to frequently occur on the Plum, and has been found upon the Pear. Professor Beach, of the New York Agricultural Experiment Station, tells me that he has found it upon the Apricot. In some sections of the state it is

very destructive to shade-trees, particularly the Elm and Maple.

The accompanying illustration represents a caterpillar feeding upon the under surface of an Apple-leaf. An injured fruit is represented on the left.

Victor H. Lowe.

[This is the insect whose larvæ have been so destructive of the foliage of Lindens and other trees on the Common and in the streets of Boston and in other eastern cities. In our last week's issue some of the methods used to keep it in check in New York were given.—*En.*]



Fig. 43.—Larva of the White-marked Tussock Moth.—See page 314.

has found three individuals in localities remote from one another, Mr. Thomas B. Allen, of Boston, sends us specimens which are identical with the cultivated plant, and show that this is a natural variety and not a nursery seedling.

Kalmia latifolia, var. *myrtifolia* (see figure 44, on page 317), is a very compact, much-branched, leafy shrub with slender contorted branches, and when fully grown is not more than three feet high and broad. The flowers do not differ from those of the ordinary *Kalmia* in size, color or marking, but the leaves are not much more than an inch long and a third of an inch wide.

This pretty dwarf is an excellent plant for situations where the common Laurel would occupy too much space, or for the margins of masses of larger plants. It must be propagated by grafting or layering, as it is not probable that its seeds would reproduce its small leaves and compact habit.

Plant Notes.

SPIRÆA ANTHONY WATERER.—This is a seedling of that variety of *Spiraea Japonica* which is known in gardens as *S. Bumalda* and which is distinguished by its dwarf, compact habit, its persistent flowering and bright red flowers. S. Anthony Waterer originated in the Knaphill Nurseries, at Woking, in England, a few years ago, and only differs from its parent in the deeper, brighter and more intense color of the flowers. As it begins to flower freely when only a few inches high and continues to produce its large flat corymbs from July until frost appears, this shrub promises to be a capital addition to the rather short list of autumn-flowering hardy shrubs. It has flowered for the first time this year in the United States in a few gardens to which Mr. Waterer has sent it for trial. A beautifully colored plate of S. Anthony Waterer was published in *The Garden* last year. It has received a first-class certificate from the Royal Horticultural Society and has been described by our London correspondent in this journal (see vii., 34).

LIGUSTRUM OVALIFOLIUM.—Although this plant is usually sold by nurserymen under the name of the California Privet, it is an Asiatic species which has become very common in this country. It is not a graceful plant in habit, like *Ligustrum Ibota*, but is stiff and whippy in growth. It has, however, the beauty that comes from rude health, and its erect branches are closely covered with glossy foliage, which often remains on the plants until midwinter. It is planted more generally in the small parks of this city than any other shrub, and its use is justified by its ability to endure drought, smoke and dust and other hardships which generally make shrubs unhappy in large cities. This year the plants here have been for some reason unusually floriferous, and in some of the squares and churchyards specimens ten or twelve feet high, covered with large clusters of white flowers, with a background of glossy leaves, have been very effective. Where this Privet can be trusted to endure the winters, it makes hedges which can be shorn with the greatest precision, and which, nevertheless, will cover themselves for weeks with feathery flowers. A photograph of such a hedge in one of the southern states was recently sent to this office, and makes a striking picture.

CLEMATIS COCCINEA.—This interesting plant, which was introduced into cultivation more than twenty-five years ago, has proved able to survive the climate of New England, although it is a native of Texas and the south-west. It grows to the height of eight or ten feet in this latitude, and is a smooth, slender vine with somewhat leathery trifoliate leaves, and solitary flowers borne on slender, but erect, peduncles six or eight inches in length, and sometimes even longer. The flowers, which are about an inch long, may be called bell-shaped, although they are somewhat contracted at the point where the sepals begin to spread, so that their diameter is smaller here than it is nearer the base, and the sepals are so thick and fleshy that the mouth is small. Their color on the outside is a light scarlet or

New or Little-known Plants.

Kalmia latifolia, var. *myrtifolia*.

THIS form of the Mountain Laurel has been an inhabitant of English gardens for many years, although it has escaped the notice of writers on the American flora, and we find no allusion to it in any of the numerous works on the botany of North America. The variety was mentioned, however, by Rand in his book on the Rhododendron, published in Boston in 1871, and in the *Revue Horticole* for 1883 André describes and figures it on page 10.

A plant of this *Kalmia* obtained from an English nursery has inhabited the Arnold Arboretum for many years, but until this season we have never known it except in gardens. From Princeton, Massachusetts, however, where he

coral, and a pale yellow within. The foliage is more thin and open than that of *Clematis crispa*, so that the plant is not as useful as some other species where a thick screen is desired. But this peculiarity of habit makes it specially useful for planting among shrubs, as it climbs through and over them without covering them up and smothering them. Our common *C. Virginiana* never looks so well as when it garlands and festoons wayside shrubbery, but *C. coccinea* has quite a different effect in such a situation, as the long stems hold the bright flowers well out from the foliage of the bushes among whose branches it rambles. We know a plant of this *Clematis* which for at least ten years has been growing among some *Viburnums*, and the group is brightened by its flowers from early July until after hard frosts, for it is one of the striking merits of this plant that, while it bears flowers somewhat sparsely, it produces them continuously throughout the season.

CURMERIA WALLISHII.—This is a very compact Aroid with ornamental leaves, and as a stove ornamental plant can hardly be excelled for neatness of habit and beauty of foliage. The broadly ovate-lanceolate leaves are of a deep velvety green, with silvery gray and yellow blotches parallel with the secondary veins. The spathe is quite inconspicuous, being of a yellowish white color, shorter than the spreading leaves. The plant grows to a height of eight or ten inches, forming a mass of foliage from underground stems. It requires heat and moisture for its full development. It grows well in a mixture of peat, sphagnum-moss and broken pieces of cow-manure, preferably in a close atmosphere. The propagation by means of division or by pieces of the short fleshy rhizome is slow, but easy. The plant, although too tender for general use, makes a fine object for table decoration.

Cultural Department.

Hardy Perennials.

IN the front row of the mixed border, and also in the rock-garden here, are large patches of *Sedum stoloniferum* thickly covered with pink blossoms. This is an exceptionally good *Sedum* and makes a bright display at this time. It is a prostrate plant, and the part of the stem that creeps along on the ground is without leaves, and roots at almost every node. The upright stem is about six inches high, has opposite spatulate leaves, which are coarsely toothed above the middle, and they are about one inch and a half long. The pretty pink flowers are three-fourths of an inch in diameter and are borne in terminal cymes, which measure three inches across. It is a native of the Caucasus, and is perfectly hardy here without any sort of protection whatever. A good position for this *Sedum* is a sunny place in the rock-garden or the front row of the mixed herbaceous border. It is not particular about soil, but the most vigorous plants here, and those that produce the most flowers, are in a light, sandy soil, where they get plenty of sunlight all day. Another point in its favor is that it readily endures long periods of dry weather. The plants are easily increased. Every small piece has plenty of roots and will soon grow into a large specimen. This species has had several specific names and is figured in the *Botanical Magazine* under the name *S. spurium*.

Another good Stonecrop in bloom now is *Sedum Kamtschaticum*, a prostrate plant with stems six or eight inches long, and oblong-ovate deep green leaves. The yellow flowers, which are three-fourths of an inch across, are in terminal cymes and are plentiful. It is quite hardy and grows well in any ordinary garden soil, but, like *S. stoloniferum*, it does best in a sunny position.

The Japanese Stonecrop, *Sedum Maximowiczii*, is an erect species and a good herbaceous plant. It is about fifteen inches high and its stems are terminated with large spreading cymes of yellow flowers, which are produced abundantly either in sun or shade.

A small bed of *Campanula pusilla alba* attracts special attention at this time. The dark green leaves of this handsome dwarf Harebell make a thick carpet, and from it rise slender stems four or five inches high, with pendulous, pure white, bell-shaped flowers, which are borne in goodly numbers and make a fine contrast against the foliage. It is a useful plant for the rock-garden when in a slightly shaded position and

not too dry. It increases readily, either by division or when grown from seed.

A few days ago, at the Shady Hill Nursery, Bedford, Massachusetts, I saw a large bed of *Campanula Carpathica*. As is well known, this Harebell produces more or less flowers during the entire summer. The bed, completely covered with flowers, suggested the advisability of using this as a bedding plant. Large plants in the borders are flowering profusely. The flowers are large, cup-shaped, and are borne on stems ten inches high. It is one of our best border plants, growing well in a light rich soil, away from the shade of trees. Seeds are produced in great abundance, and a stock of seedlings can readily be raised. Several good varieties of this species have been distinguished; some of them have pale blue flowers, and one has pure white ones. As the varieties do not always come true from seed they should be increased, either by division of the roots or from cuttings.

A large bed of *Platycodon grandiflorum* is especially attractive at this time. It is sometimes named *Campanula grandiflora*, and was figured under this name in the *Botanical Magazine*. It has beautiful, large, dark blue flowers, and some of the visitors to the garden compare their color to that of *Clematis Jackmanni*. We find this one of the easiest hardy perennials to grow. It requires no protection in winter, not even a covering of leaves. In vol. vi., p. 346, of *GARDEN AND FOREST*, Mr. Watson calls attention to *P. grandiflorum*, and says it is of questionable hardiness, and if the weather is severe in winter it perishes at Kew. This must be from some other cause than its inability to endure cold, because plants that are less than one year old can stand zero weather without protection here. Platycodons produce seeds very abundantly, and from these young plants are readily raised. Plants that were grown from seed sown last March are blooming now and have good-sized flowers, considering that the stems are only six inches high. In raising plants from seed one gets a number of different forms. Some come with semi-double flowers, while others are a whitish color, and many of them are of different shades of blue. The typical color is dark blue. *P. grandiflorum* is an old plant and was introduced in 1782. It has thick, long, fleshy roots, and full-grown plants carry six or more stems, which vary in height, some being a yard high. The tallest are better for being staked. The foliage is dark green. The flowers are from two to three inches across, and are produced in clusters at the ends of the branches. A deep rich soil and a position where they will not get too dry in summer seems to suit the Platycodons in our garden.

Large plants of *Cimicifuga racemosa*, or, as it is sometimes called, Black Snakeroot, are conspicuous with their long, feathery racemes of white blossoms. The variety *dissecta* is also in flower, but the only difference between the two is in the leaves. The leaves of the variety are more deeply cut than they are in the type.

Harvard Botanic Garden.

R. Cameron.

Some July Flowers.

TWO-SPATHED flowers of the Spotted Calla are very common, but last week I found two examples of abnormal growth which I have never seen or heard of before. The stems in these cases, instead of being solid, were like tubes not grown together all round, but with two edges folded in from the spathe to the ground, as though the stalk had been flat, about an inch broad originally, and then the edges folded inward, one lapping a little over the other; the inside of this imperfect tube being white, just like the spathe itself. One of the two specimens had two spathes, but, as in other "double" Callas, only one spadix.

Galtonia princeps is now in bloom; it is smaller in all its parts than *G. candicans*, and its flowers are greenish white. On the whole, it is hardly worth growing by those who care only for conspicuous display, but it has a distinctness about it which will secure for it a place in my garden for some time at least. Its chief deviation from the pattern of *G. candicans* is that its flowers are produced in a head or umbel, and not in the form of a spike. According to the *Genera Plantarum*, there are but two species of *Galtonia*, but there is a third, *G. clavata*, a green-flowered species, which is figured in the *Botanical Magazine*, t. 6885.

I take great pleasure in forcing *Galtonia candicans*; a bulb planted in a five-inch pot in December will flower finely in March, and will attain as stately a growth as those grown out-of-doors. It is somewhat singular that bulbs taken from the ground in October, and started after only two months' rest, will bloom as early as those which were forced last season and dried off in May.

Littonia modesta, which is commonly treated as a green-

house flower, does perfectly well if planted in the garden in May or June. It makes a stocky, sturdy growth, with little inclination to climb, and, to the best of my belief, produces more of its beautiful vitelline-colored bells than when in a greenhouse. As the growth is shorter, the flowers are closer together when planted out, and the plant is more effective. The flowers are by no means the only beauty of *Littonia*; the foliage is dark green and very glossy, every leaf tipped with a tendril, and the seed-pods, which are formed by every flower, are as smooth and polished and green as can be imagined. They retain their attractive appearance perfectly until the seeds are ripe, and then split open lengthwise, displaying the full rows of brilliant orange seeds, about as large as those of Sweet Peas. I have raised the so-called *L. Keiti* from seeds several times, but it appears identical with *L. modesta*. A new species of *Littonia* has lately been discovered in Arabia, *L. obscura*. The nearly allied *Gloriosa* has once or twice done well with the same treatment, but it cannot be depended upon out-of-doors in this latitude. The tubers of both are subject to decay if kept from the air during the winter.

not their own. *A. venusta*, so-called, is a very fine species with flowers as large and as bright as those of the *Canna* *Florae Vaughan* and as bright yellow, but when I tried to make sure of its name I found that there is no such species as *venusta*. There is a *venustula*, which Mr. Baker describes as having flower-stems two or three inches high. *A. Chilensis* figures in catalogues, but apparently it should be *chiloensis*. The kind sent me as *A. aurea* is really that form of *A. hæmanntha*, figured as *pulchella* in the *Botanical Magazine*, t. 2354. The *A. aurantiaca* of gardens does not correspond with Baker's description.

Canton, Mass.

W. E. Endicott.

The Gladiolus.

THE *Gladiolus* species are often interesting for a certain quaintness of flower and odd coloring, but it cannot be said that they are generally attractive plants. Many of the Asiatic kinds flower very early, and have long since ripened seed and foliage, and are reliably hardy here if protected from moisture in summer. They start into growth during the win-



Fig. 44.—*Kalmia latifolia*, var. *myrtifolia*.—See page 315.

Among my illustrious unknown is a bulb which came to me from Africa some years ago. As long as I grew it in a pot it made comparatively few and small leaves, and I called it *Drimiopsis Kirkii*, strongly hoping that it was that beautiful species. Last year I grew it in the garden, and it put out its thick, fleshy, pointed leaves to the length of a foot. They displayed the same beautiful dappling of green and olive that they had shown in the pot, and in August threw up a flower-spike ten inches high, thickly set with small purple bells. *D. Kirkii* has white flowers, and my plant is, therefore, something else; I suppose one of the south African *Scillas* of the section *Lebedouria*. It is not one of those figured in the *Refugium Botanicum*, nor can I positively identify it as any of those described by Mr. Baker in the *Journal of the Linnean Society*. It is now in bud again, and I shall hope to make sure of its name.

Alstroemerias are very satisfactory garden-plants as far as their beauty goes, but the names they go under are frequently

ter at every favorable opportunity. These are mostly of the *G. segetum* type, a species not at all attractive, the coloring being a purplish red or magenta. I have numerous forms of this type, varying somewhat in size, habit and markings, and under numerous names.

Except the quaintly colored *Gladiolus Byzantinus*, none of the European and Asiatic species seem to me worth garden-room except in collections. The case is different with the African kinds, for among these we have a number of distinct kinds, though generally of quiet coloring. The well-known *G. Saundersii* may, perhaps, be rated as the most attractive of these, its graceful habit and fine flowers being valued in the best gardens. Next to this in interest and beauty is *G. oppositiflorus*, the long-lost species which was supposed by Herbert to be one of the parents of the modern *Gandavensis* hybrids. This is one of the most vigorous of the family, with leaves five feet or more tall and flowering spikes with two or three branches. The well-opened flowers are rose-colored and white. This is

a great seed-bearing plant, and will soon be more available. *G. aurantiacus*, *G. Leichtlinii* and *G. Crucutus* have individually pretty flowers, but require careful cultivation to show their best form. *G. dracocephalus luteus* is a more pronounced yellow than the old type, but is more vigorous than beautiful in flower. It is rather a plant for the hybridist. *G. sulphureus* has flowers of a greenish yellow tint, and these are not as pretty as those of the form of *G. tristis*, which is often sold by plantsmen as *G. sulphureus*. *G. platyphyllus* has flowered here, but it is only a collector's plant. *G. Eckloni* and *G. Papilio-auratus* have shown no flowers during their two seasons' growth in my garden, and under ordinary conditions appear to be of only moderate vigor and height. *G. purpureo-auratus* has been so much overshadowed by Monsieur Lemoine's hybrids that probably only a few growers still retain this odd, hooded flower species. There are numerous other African species among which there are possibly attractive things. My collection of other sorts has mostly perished from hardships before flowering.

Elizabeth, N. J.

J. N. Gerard.

Notes on Onions.

ONIONS may be grown by three different methods—by sowing the seeds in the open ground in spring, by planting sets, or by starting the seeds under glass and afterward transplanting the seedlings out-of-doors. The first two ways are more commonly practiced, but the third is undoubtedly more profitable, although entailing more trouble and labor. This has been called the new Onion-culture, but the method is by no means new. It has been practiced in Great Britain for a number of years for the production, principally, of exhibition specimens. Grown under any circumstances, however, Onions are far more reliable as a crop on this side of the Atlantic than in England, where the Onion maggot is such a persistent and destructive enemy. We grow Onions here under all three methods, and each has its advantages. Those sown in spring are used in a green state; the sets which mature early we depend on for general summer use, while the others are kept for fall and winter. The first two methods are so generally known that cultural directions here would probably be of little service, but a description of the third method may be useful to some who have not tried it. We sow the seeds thinly in flats early in March in ordinary potting-soil, and place them in a greenhouse with a night temperature of fifty-five to sixty degrees. We keep them only moderately moist until they are well started, when plenty of water is given. In April they are removed to cold frames and gradually hardened off, and in May they are planted in the open ground. Sowing in flats is most convenient where only a limited supply is needed, but if grown on a large scale it is better to sow them in a hot-bed, from which they can be transplanted quite as conveniently. Hardening off must in no case be neglected. The ground must be well tilled and liberally manured. The young plants should be set in rows one foot apart and eight inches allowed between the plants. An impression should be made just large enough to insert the roots; the small bulbs should not be covered. When the roots have a good hold of the soil, which will be in about a week after planting, it is well to go along with a foot on each side of the line and tread the soil firmly, choosing a dry day, when the surface of the soil will not be cloggy. All that will be required after this is to keep the surface well stirred with the hoe, so as to suppress the weeds and help to retain the moisture in the ground. By the measurements of a sample grown by each of the three methods the following results are shown: Those sown in the open ground now average seven inches in circumference, and may swell just a little yet; the sets average eight inches, and are done swelling; those sown inside and transplanted average ten and a half inches, and look as if they would grow quite a little more. It is useless to grow many varieties by this latter method. Prizetaker and Yellow Globe Danvers are two that are most reliable, and they are also excellent keepers.

Tarrytown, N. Y.

William Scott.

PeaS.—Bliss's Abundance and Stratagem have proved two good varieties for summer use. These are wrinkled varieties of the highest table quality. As compared with the Champion of England they have a longer season of bearing and are less liable to mildew, a disease most ruinous to the Pea crop at this season, and as they are more dwarf they require less support. We sow Peas every week throughout the season, and if the weather continues as favorable as it has been we shall have a continuous succession until frost. Peas, as a summer crop, succeed best on a moist subsoil. Drought quickly shortens their growth, when they become an easy prey

to mildew. We always plant deeper in summer than in spring, puddle the seed in and leave a depression for later waterings. Our last sowing will be made early in August. American Wonder sown on the 10th of August have matured. Only early varieties should be selected for late sowings, and Kentish Invicta has proved one of the best round-seeded kinds here. I made an examination of all my pea seeds before planting this spring and marked the quality on the outside of the seed bag. So far I find the varieties most free from defects, principally in the integument, were the healthiest growers and had the fewest misshapen pods—Admiral, Horsford's Market Garden, Paragon, Nott's Excelsior, American Wonder, Bliss's Abundance and Stratagem and the Chelsea were all well formed and developed. Champion of England (though not usually so), Telephone, Heroine and Shropshire Hero were poor.

Strawberries.—The only varieties not injured here by late spring frosts were Bubach No. 5 (early) and Timbrell (late). Sharpless and Michel's Early were completely blasted. Haverland and Parker Earle bore less than half a crop. Our Marshalls were planted late last autumn; the crop was poor, but we do not consider that we put it to a fair test as to hardiness. Perhaps some of your readers who have tested it fully would give its merits in this respect. Our best Strawberries have always been from new beds, planted the previous August. If our plants have looked thrifty we have carried them over for another season, but have generally regretted doing so. Where runners are plentiful, plants, three in a hill, and from two to two and a half feet apart, will give a good crop of excellent berries. If a large quantity of medium-sized berries is wanted, it is probably better to make plantings in rows three feet apart, from held-over plants, in spring-time, and allow these to make matted beds for next season's bearing. This plan is followed largely by market-growers. In preparing our ground we dig in a liberal supply of barnyard-manure and air-slaked lime. After this, Bowker's special Strawberry fertilizer is put on at the rate of about half a ton to the acre and lightly pricked in with forks. If the ground is dry we give it a good soaking the day before we plant and use boards in preference to walking on the sodden ground.

Wellesley, Mass.

T. D. Hatfield.

Correspondence.

Plant breeding.

To the Editor of GARDEN AND FOREST:

Sir,—Professor Goff's plea for greater attention to plant-breeding at the experiment stations (page 292) represents a general attitude of mind toward the question of the origination of varieties of plants. Inasmuch as he cites me as one who has introduced a variety which has been dignified with a name, I may be allowed, perhaps, to express my own convictions upon the subject. I cannot agree that the origination of varieties, as the phrase is ordinarily understood, should be a leading thought with the scientific experimenters. This conviction proceeds from the fact that man does not have it in his power to summarily produce a new variety with any degree of certainty. The varieties which appear year by year are what we term chance productions, and they must always be so to a very large extent. The term plant-breeding is borrowed from the animal industry, and persons generally assume that because there is something like scientific exactness in the breeding of animals, there ought to be a similar exactness in dealing with plants. But there is and can be no definite plant-breeding in the sense in which there is animal-breeding. The analogy is only superficial. A full statement of the fundamental dissimilarity between animals and plants, as I understand it, will be given in a small work which I am now sending to the press.

The true method of improving the vegetable kingdom is that pursued by nature—the slow unfolding of one form into another, the carrying forward of the whole body of cultivated forms of any species. There are, probably, few varieties of plants which are habitually grown from seeds which retain their original forms more than a decade. Through the influence of selection and cultivation, the progeny constantly departs from the parent type, although we fancy that we still have the same variety because we retain the same name for all the descendants. The Ignotum Tomato, which Professor Goff is kind enough to mention, was introduced by me in 1889; but the form which I introduced is probably nowhere in cultivation at the present time; it has passed out by variation into poorer and probably into better forms. Now, the person who centres his attention upon the mere production of new varieties,

is likely to forget the importance of the underlying principles and forces which are capable of uplifting the vegetable kingdom. We need a general uplift more than an occasional spasm. We must make more of the varieties which we have, and by doing so we push forward the progeny year by year in a gradual and enduring evolution. We may not recognize the progress from year to year, and may not be able to give varietal names as freely as we should like to, but the grand and final result is to be attained thereby. I look upon new varieties as so many new starting-points for still further development, not as final or permanent things in themselves.

The fact is, that our eyes are dazzled by the reports of creations in plants as they are by new and startling inventions. But one should be suspicious of the genesis of varieties which are said to have been produced outright by any foresight of the operator. Time will discover the merits of all pretensions; and it will forever enforce the undying principle that the amelioration of the vegetable kingdom is a slow unfolding of the new out of the old, through the simple and quiet agencies which man employs in cultivation and selection.

Z. H. Bailey.

Cornell University.

Rhododendrons in a Hard Winter.

To the Editor of GARDEN AND FOREST:

Sir,—The excellent article from Mr. H. H. Hunnewell, on Rhododendrons, in a recent number of GARDEN AND FOREST, adds testimony from valuable experience on the important question regarding failure through supposed lack of hardiness of these beautiful plants.

There would appear to have been already sufficient experience to demonstrate the fact, which many have heretofore considered a theory, that drought during the summer has as much, or more, to do with the loss of Rhododendrons and other evergreen plants as the cold in winter.

The Rhododendrons planted at the Washington Bridge, Amsterdam Avenue, in this city, are a good illustration on this point. In those plantations, although in a most exposed situation and without any protection during the past winter, and notwithstanding the severe drying weather early this spring, there is hardly a single plant that does not now appear in perfect form, health and vigor.

These plants, I am informed, were supplied with abundant moisture all last season, although not enough to force an abnormal growth. Had the plants been subject to excessive drought last summer or autumn the loss would undoubtedly have been as severe as in the parks here, in Brooklyn and elsewhere, as already referred to in GARDEN AND FOREST.

The more we learn to appreciate the simple natural requirements of all hardy plants the better the results that will invariably follow.

Fred. W. Kelsey.

New York.

Recent Publications.

Forest Management.—II.

A Manual of Forestry, by W. Schlich. iii. *Forest Management*. London: Bradbury, Agnew & Co. 1895.

The second part of Dr. Schlich's book deals with the financial calculations required in the management of forests so as to determine the best methods of management in view of the return in money. The formulæ with which this part of the work is necessarily filled are so frequently interspersed with explanations in words that the reader who does not care to go into any mathematical study of the subject may still find a great deal to interest and instruct him, but the discrepancy which has already been noted between the economic situation in the United States and in Europe demands a considerable degree of latitude in the application of principles. For example, on page 153 it is said that the selling value of the forest is of subordinate importance. Nothing can be truer than this remark when applied to European conditions. With us it is otherwise. In the United States the value of a piece of property to its owner is either its selling value or its productive value. The first of these is the more important. In many cases it is the only value which is of real moment, the cost value being useful only for comparison. Even where the owner has no intention of selling, he usually estimates the value of his land at what it will bring. In general language the selling value is meant whenever we speak

of what a piece of land or other property is worth. Only the special circumstances which give one man an advantage over others in working a particular piece of forest give the productive value any interest as against the selling value of the property. The basis of estimate, except for very small or otherwise unmerchantable holdings, is uniformly the selling value. Of this the productive value is often a component factor.

It should be carefully noted that the value of Dr. Schlich's book for use in this country loses but very little, at least in one direction, by differences such as that just referred to. In all great fundamentals the principles of forestry are essentially the same everywhere. The modifications which are required usually depend on temporary conditions, and will tend eventually to disappear. They are in the nature of exceptions, and should not be understood to invalidate the rules; at the same time they are often of vital moment where they apply, and they must not be overlooked.

The use of the discussion of principles in exhibiting the nature of the subject dealt with is very well illustrated in this book, although many of the calculations, operations and methods of work described are as yet inapplicable to this country. Still they all serve to point out the real nature of the forest. On page 200, for example, a discussion of the various kinds of rotation begins. Some of them have little or no practical interest in this country at present. Nevertheless, the chapter is one of the most instructive in the whole book because it reveals to the reader in a striking way some of the fundamental characters of the forest. The same remark applies to the discussion of the normal age classes (chapter iii., part II.) and to many other subjects.

The question of vocabulary which is referred to in the first part of this review is brought up again by Dr. Schlich's use of the term "wood" as indicating a part of a forest arbitrarily separated from the rest for the purposes of management—a distinction which it would be extremely difficult to reconcile with the habitual meaning of the word in this country, where it is generally made to refer to a comparatively small area of woodland surrounded by clearings, or otherwise delimited by natural boundaries. Another instance of the use of technical expressions with which we could hardly agree is afforded by the terms "solid cubic foot" and "stacked cubic foot," the first applied to large timber, the second to cord wood. The use of cord foot, a well-established term in this country, permits cubic foot to bear its legitimate meaning, and does away with all danger of confusion, while shortening the terms. The chief disadvantage of forest terms introduced into English from the German, as in the case in point, is the tendency to use a description instead of a name.

Perhaps the most useful subdivision of the present volume is that which deals with the Brandis method of determining the yield of the forest. It consists, briefly, in ascertaining, with more or less exactness, according to the circumstances of each case, the number of trees ready for the axe in any given forest, and the number of years which it will take to replace them. By dividing the first of these quantities by the second, the number of trees which may be cut annually with safety to the forest is ascertained in an extremely simple and sufficiently accurate manner. This method was used by Doctor (now Sir Dietrich) Brandis in Burma in 1856, and lay at the root of his exceedingly successful treatment of the Teak forests of Pegu. Its fitness for use in this country is not open to question, and its application in very many instances, as for example in the Adirondack Mountains of this state, is greatly to be desired.

New York.

Gifford Pinchot.

Notes.

A correspondent of *The Gardeners' Chronicle* praises the display made by a dozen plants of *Rosa setigera* massed in the collection of Roses at Kew. He adds that the beauty of this species and its other valuable properties are not appreciated as they should be in England. He could have said with

truth that the Rose has hardly begun to be appreciated in its native country.

New parsnips, sweet-potatoes, okra, tomatoes, oyster-plant and egg-plants are now coming from New Jersey, cauliflower from the Catskill region of this state, and lettuce from Boston. English or Windsor beans sell for thirty cents a half-peck in the pods. Taragon costs seven cents for a small bunch, and nasturtiums seventy-five cents a quart.

The white-flowered Sweet Pea, Emily Henderson, was the earliest variety to bloom this year in a collection of more than fifty named sorts. There is a special strain of the Blanche Ferry, known as Extra Early, which blooms under most conditions slightly in advance of Emily Henderson, but the flowers are not white and the plant is not a persistent bloomer, so that about its only merit is that of extreme earliness.

Last year small consignments of California canned fruit were sent to Egypt and Ceylon by the way of Hong Kong, but the freight was too high to make the venture profitable. Large orders, however, have been received again for this fruit, which is highly prized by foreign tourists on the Nile and by rich English planters and army officers in Ceylon, and this year it will go direct to London by sailing vessel and thence to Alexandria and Colombo.

According to a dispatch to *The Tribune* of this city, ten million feet of pine and fir lumber are now being loaded on the Pacific coast, or are on their way to South Africa, for use in timbering the deep mines. This lumber is said to be much superior in length and strength to that from the Baltic region, which held a monopoly of the market until two years ago. The first shipments were made by sailing vessels, but several steamers are now regularly engaged in the trade.

The last number of *The Orchid Review* contains a portrait of a striking Cypripedium which is in all probability one of the natural hybrids which occur so rarely in this genus, only two others being recorded. The plant is called *C. x Littleanum*, and its foliage, broad dorsal sepal, nearly horizontal petals, and the shape of the lip indicate *C. Lawrenceanum* as one of its parents. Mr. Rolfe believes the other parent to have been *C. Dayanum*, and gives some ingenious reasons in support of his theory. At all events, it is to be hoped that a cross will be attempted between these two plants with a view to reproducing something like the present fine hybrid which bears a striking flower, measuring five and three-quarter inches from tip to tip of the petals, and having a dorsal sepal nearly two inches broad.

Skilled gardeners do not need to be reminded that this is the season for moving the bulbs of *Lilium candidum* or other perennial plants whose tops die after flowering and which then put forth new leaves to remain green all winter. It may be worth while to remind amateurs and beginners that the middle of August is the safest time to move the large and fleshy roots of many early-flowering perennials, like *Paeonies*, whose leaves do not die down. When transplanted at this season they will put forth enough new roots before the cold weather sets in to safely establish them and insure their flowering next year. Coniferous trees can also be safely moved in late August, after the new growth has hardened, but, unless there is some special reason for transplanting them now, it will be found safer on the whole to postpone the operation until early spring.

On the western edge of the Santa Clara Valley, near Los Gatos, California, is a factory in which red and white wine grapes are crushed and their juice turned into what is called "grape-food," that is, the juice is concentrated without fermentation. Fifty tons of grapes are treated every day, and the process of manufacture is described by a correspondent of *Harper's Weekly* as follows: "A small but constant stream of fresh juice flows into the upper end of a copper cylinder nineteen feet long and two feet in diameter and inclined at a slight angle. This cylinder revolves slowly in a hot-water jacket kept heated to 150 degrees, Fahrenheit. The juice forms a film on the interior of the cylinder, the water evaporates from it under the heat, the vapor is drawn away by rapidly revolving exhaust-fans, and the juice, which has been but sixty seconds in passing through the cylinder, trickles from its lower end in a warm syrupy stream reduced to one-quarter of its original bulk, but retaining all its original elements except the water."

A correspondent of *The Rural New Yorker*, whose Grape-vines were frozen back this spring, writes that he broke off all the new shoots and shortened in the wood. The result was that the vines treated in this way put out new shoots from adventitious buds which grew vigorously with clean bright leaves, showing canes of rich shining color, while canes left for

comparison remained decrepit and crooked. Of course, a comparatively small amount of fruit set, and this was on shoots from the accessory buds at the nodes rather than from the adventitious ones. If the breaking out of the partly dormant accessory shoots had been deferred until after the frost, at least half a crop of fruit might have been obtained from the shoots of these duplicate buds, which seem to be provided for such a crisis as this in the life of the vines. But why should the breaking off the frozen shoots be such an advantage? Is it possible that the sap which is disorganized by freezing causes injury to the vine—a sort of blood-poisoning—when taken up into the circulation?

The best Elberta peaches from the south are now rivaled by large specimens of the juicy white-fleshed Stump the World and the showy Belle of Georgia, the choicest of which bring seventy-five cents to one dollar a dozen. Niagara and Delaware grapes, from the south, cost twenty cents a pound, and Black Hamburgs, from Newport hot-houses, \$1.00 to \$1.25; Black Muscats, from California, are already seen on the sidewalk fruit-stands, but they are small and uninviting. The first Tokays, from the same state, arrived during the latter part of last week. Choice plums, as Columbia, Egg, with Burbank, Kelsey and other Japanese varieties, and German prunes bring twenty-five cents a dozen in the fancy-fruit stores, and nectarines twenty-five to forty cents. Alexander apples, from California, cost forty cents a dozen. California seedling oranges are now among the best offerings of this fruit and sell at retail for sixty cents a dozen. Jenny Lind melons, from New Jersey, sell at three for twenty-five cents; large Anne Arundel cantaloupes, from Maryland, bring twenty cents each, and good specimens of the salmon-fleshed Christians command twenty-five cents.

In the last number of *Meehan's Monthly* the editor tells an interesting story of being summoned to hold an inquest over a dead Sugar Maple-tree. It was supposed to have been destroyed by a leak in the city gas-main near its roots, but an examination convinced Mr. Meehan that the tree had died literally from sun-stroke. This Maple had been planted on the street about twenty-five years, and was some four feet in girth. The trunk, however, instead of being cylindrical, was shaped like a triangular prism, a peculiarity owing to the fact that on three sides of it the inner bark and wood had been killed, while the outer bark continued to cover up the injury, so that the only living wood was at the angles of the trunk. Practically, no more than one-third of the surface of the trunk was alive, and when the exceedingly warm weather of last month came the limited number of ducts were not sufficient to supply the moisture needed to meet the rapid transpiration from so large a surface of foliage, consequently the leaves wilted and the tree died. Mr. Meehan adds the counsel that whenever the trunk of a tree takes on this angular form it should be examined under the bark, and if the flatter portions are found dead, the bark and the decaying part of the wood should be wholly cut away and the denuded part painted to check the rotting. In time healthy wood may grow over such a scar and the life of the tree may thus be eventually saved.

Mr. W. K. Dexter, of St. Louis, has offered to present 250 acres of land at Hiawatha Lake to the people of Hennepin County, Minnesota, as a public park. The donor's purpose is to have the tract preserved in its natural state, and he therefore makes it a condition of the gift that no landscape-artist shall be allowed to touch it. Mr. Dexter evidently entertains the mistaken belief that landscape-art and formal gardening are identical terms, or, at least, that landscape-gardening means primarily the destruction of natural beauty to make room for something that is artificial. Perhaps, too, he has not considered the fact that the highest beauty of this wild tract will never be discovered until some real artist studies out a practical scheme for making its key-points inviting and accessible, nor that its original charm will surely disappear as it becomes frequented unless provision is made for restoring what is worn away and maintaining and developing its essential elements, a work which also requires the highest artistic taste and training. When Mr. Dexter gives himself thoroughly to a study of the problems of design and maintenance, which must be solved if his praiseworthy and public-spirited purpose is to be carried out to the best advantage, he may still feel inclined to resent any suggestions from the class of landscape-gardeners whose loftiest aim is to arrange flower-beds and plant purple Barberries and golden Elders on suburban lawns, but he will welcome the advice of some true artist in landscape, who will be certain to have a broad appreciation of Nature and a respect for her simplest as well as her noblest manifestations.

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLE:—Color in the Garden	321
Notes from a Botanic Garden.—II.	Professor W. G. Boul.
FOREIGN CORRESPONDENCE:—London Letter.	W. Watson.
ENTOMOLOGICAL:—Another Herbarium Pest (<i>Epehestia interpunctella</i>). (With figure.)	J. G. Jack.
NEW OR LITTLE-KNOWN PLANTS:— <i>Opuntia fulgida</i> . (With figure.)	Professor J. W. Toumey.
PLANT NOTES	326
CULTURAL DEPARTMENT:—Summer-flowering Plants	W. N. Craig.
Notes on Crinums	J. N. Gerard.
Two Good Kniphofias	Max Leichtlin.
Hardy Perennial Plants	S. A.
Cucumber, "Cool and Crisp."	W. R. S.
CORRESPONDENCE:—The Rose Garden on the Wooded Island, Jackson Park, Chicago	Fanny Copley Sewey.
Luther Burbank's Hybrid Lilies	Carl Purdy.
Iris hexagona	Lora S. La Mance.
RECENT PUBLICATIONS	329
NOTES	330
ILLUSTRATIONS:— <i>Epehestia interpunctella</i> , Fig. 45.	324
<i>Opuntia fulgida</i> in Arizona, Fig. 46.	325

Color in the Garden.

THE scheme of color in beds and borders is a problem which is seldom grappled with successfully. A combination of trees is sometimes as painful to the color-sense, owing to conflicting tones, as the jarring of scarlet Geraniums and purple Coleus. Refinement of perception in this direction is the final test of the true artistic gift in planting.

Even in small gardens it is possible to give a keynote of color by which to tone the whole, so that discordant hues may be excluded; but to control the effect one must be ever on guard lest Nature thrust in that shade of purple-pink which she evidently intended for a landscape in which green predominates, as in country roadsides and the edges of woods. Florists' colors do not always come true, and one is frequently dismayed at the development of this objectionable tint in flowers described as scarlet, so that one who weeds relentlessly may find unsightly gaps even in a well-planned border of gay perennials or annuals. Only an expert gardener can make complicated pattern-beds endurable, but it is not so difficult to make the simpler and more natural forms of gardening interesting on a small scale. Most beautiful effects are obtained with groups of flowers against a background of shrubbery, where they have the charm both of relief and of surprise. But it is not possible to combine with the roots of hungry shrubs those plants which require rich nurture to bring them to perfection, so that there are many lovely things that must be grown in open and sunny places, where they cannot be robbed of their nutriment. Generous beds, where they can be grouped in masses, are appropriate for these, and the plants should be so arranged that the different hues will melt into each other, rather than clash in harsh contrasts. Above all, what painters call a spotty effect should be avoided, and each color allowed enough space to make a definite impression on the eye before combining with the succeeding one. Nor should the lines of junction be sharply defined, but insensibly connect one with another, with here and there some touch of vivid contrast by way of emphasis.

It is said that all colors can be combined if the sense of true proportion be the guide, and that in this perception of

proportion lies the true secret of the beauty of the oriental rugs. It is the same with a garden, where certain colors can more safely predominate than others, notably shades of red and yellow, with their infinite variations from deep velvety crimson to soft pink, and their rich blendings of hues of brown and gold and orange, as in the Nasturtium and Marigold and Chrysanthemum, from almost black to palest buff. Blue, which is always a painter's puzzle, must be cautiously employed in the garden, and always with careful reference to its relations with contrasting flowers. It should be used sparingly, and requires white and pale yellow in its neighborhood or a mass of surrounding foliage. The Iris, rising amid its lance-like leaves; the Forget-me-not, starring the lush meadow grass; the Succory, straggling in the dusty roadside herbage; the Harebell, nodding amid rock Ferns, are Nature's hints for the proper setting of this difficult color. Masses of tall shaded Larkspurs growing against a white veranda-rail, or a mass of Ascension Lilies, show well, and their tall spikes are very effective in the angle of steps going down from porch or terrace into a garden.

Purples and lilacs can be exquisitely mingled, as in the varied shades of Irises, and they combine well with pale foliage, and with white, but should be kept away from reds and pinks. Delicate yellow relieves them agreeably, and they are very charming in some cool damp nook, where they seem to be in harmony with the quiet scene.

In Robinson's *English Flower Garden* it is wisely recommended to have flowers of cool and delicate tints in shady borders; typical plants for which use are the tall Larkspur, Monkshood and Columbines, the Alpine and Japanese Anemones, Hepaticas, White Lilies, Trilliums, Primroses (white and yellow), Daffodils and Lily-of-the-valley. Behind these flowers of the dale the author would place "sombre masses of dusky shadow rather than positive green color." In sunny places he recommends warm colors, which are harmonized by the yellow sunlight, and suggests the grouping of Marigolds, Chrysanthemums and Nasturtiums, all shades of yellow, orange and brown—a combination which could readily be tried in the simplest garden.

It is often said that the reason for the prevalent planting of Coleus and Geraniums is their comparative cheapness, but a wealth of Marigolds and Nasturtiums can be procured for the cost of a few Geraniums, and a far wider range of color, both in depth and brilliancy, can be attained by their aid, to make gay a cottage garden or the terrace of a castle. Certain perennials of great splendor, such as the Oriental Poppy, the scarlet Phlox, the Sweet William, the Bee Balm, will give a succession of trumpet notes in a border for many months, and between the strong-growing roots can be set red Gladioli to blossom in August, and Shirley Poppies, which come early into brilliant and varied bloom in proper key with them; while the tones of Salvias and scarlet and crimson China Aster can be the final notes of a symphony which will last from May till October. Numerous are the lovely blossoms of the same tone which can be interspersed with these to vary the effect and shade into the properly ensuing rosy hues worn by so many fragrant and long-cherished flowers, Roses and Pinks, Balsams and Oxalis, Verbenas and Sweet Sultans, Foxgloves and Dahlias, Perennial Peas, pink Larkspurs and Canterbury Bells, and hundreds of others, with rose-colored Aster for the late season. These should be followed by a touch of white and cream color, leading to the pale yellows, which, though deeper and richer tones, conduct the eyes agreeably to the Iris and Ageratum, the lilac Phloxes and Campanulas, the Aster, which prolong the season and deepen into the richest purple. On the other side of the reds can be a transition, through pink and white and palest yellow, as the Evening Primrose, to the tender azure of the Myosotis and the more brilliant blue of early Scilla and Hyacinth to Linaria and Bluebells, ending with the intense indigo of Delphinium and Aconite. Low-growing plants, like Pansies and Portulaccas, in tones which harmonize with the state-

lier spikes and clusters of bloom, and which seem to cover the ground, can be interspersed among the taller ones, intermingled with plants whose foliage is of such shades as will accord well with the color of the flowers.

By careful study of the times of blossoming a glowing and harmonious effect can be produced at slight expense of money, though of much time and loving thought. A result, pleasing and varied, can be obtained in the tiny square of a cottage garden by grouping the humblest and least expensive flowers, and where there are broad spaces to be filled, with great frames of foliage to enhance the beauty of the scene, a picture can be painted by an artistic hand which will afford unfailing delight. These broad rules laid down do not exclude a happy contrast here and there, but it should always be remembered that contrasting colors should be of a similar key. Deep blues can be opposed by vivid cardinal or flame color, the cerulean tints by tender rose or pale yellow, purple by gold and green; but intense contrasts should be seldom indulged in, and require great discretion in their use.

It is far easier to theorize than to carry out one's theories, as all philosophers find to their cost, but the study of the color problem is one of unfailing interest to the gardener, and when it is successfully solved the result may truly be considered a triumph. The same problem confronts the landscape-gardener, and its difficulties have often been considered in these columns. Forms as well as tints are an essential feature to be dealt with in considering final effects, and to succeed perfectly requires an artist in line as well as in color. The true gift to discern is not given to all, but each according to his light should seek to give individual expression to his fancy.

Notes from a Botanic Garden.—II.

IN trying to grow certain plants the manager of the garden is constantly thwarted by drought, excessive rains, cold, sunshine, shade or by unsuitable soil, and is constantly sent back to marsh, ravine, sand, loam or clay bank to study the favorite location of each species, and with each such effort a few more plants are made to thrive in the garden. In this way we have learned to grow well many Ferns, Hepaticas, Cohosh, Violets, some of the Mints, Sedges and Grasses, while Golden Seal we now grow to perfection. We are still experimenting on Columbo, Dwarf Thistle, Harbinger of Spring, some Gentians, Houstonia and many more.

Perhaps it was fifteen years ago that we received *Solanum tuberosum* from the Harvard Botanic Garden. It was said to be a fresh arrival from Mexico. After a few years, instead of tubers an inch or less in diameter, we grew some three inches long. For ten years, perhaps, we have been growing *S. Jamesii*, from Arizona. For the past three years more especially some of the tubers have nearly doubled in size, while the outside has changed from the brown, warty surface to a clear color resembling our smoothest potatoes in general cultivation.

In most cases, by selecting a spot of suitable size especially favorable for the plants of a given family, we are enabled to keep them near each other, but no attempt is made to plant allied families next to each other or to arrange species in an artistic manner. In the Calla or Arum family, for example, the Sweet Flag, Golden Club, Wild Calla and Arrow Arum are grown in the mud in shallow water, and just on the adjacent bank are grown Indian Turnip, Green Dragon and Skunk Cabbage. On a small inaccessible island we grow Poison Sumach and Poison Ivy, while on the neighboring bank are six other species of *Rhus*. The Ferns are on the north side of a moist bank and at the base of it, more or less shaded by trees and protected from winds. In a large space sunk a foot into the black soil of the creek-bottom Cardinal-flowers grow to perfection, while a mound near by is well covered by a group of Harebells. Among the Geraniums, a depression is made extending to a soil perpetually wet, and here they

find a congenial home. So with the Marsh Marigold, some of the Sedges, a patch of Holly Grass and some species of *Glyceria*; and for the Heath family, a depression in the muck grows two sorts of Cranberries, several sorts of Huckleberries, the Leatherleaf, a species of *Kalmia*, and Labrador Tea, while those needing drier soil are near at hand.

Near one of the ponds, and on a bog about twenty-five by forty feet, we are experimenting. The space is nearly enclosed by Arbor-vitæ or a temporary artificial screen to prevent any sweep of air and to keep out the sun, while raised on posts ten feet high is a screen of slats to check the force of the sun from above. Here we are growing Mosses from the swamp, including other things found in such places. *Calypso borealis* has flowered here for two years in succession. It is too soon to pronounce it a success in every particular.

Some plants, like Violets and Euphorbias, as their pistils ripen, shoot seeds in every direction, often from three to eight feet. On this account we scatter the roots of Violets around among the crucifers, and must scatter the Euphorbias to prevent hopeless confusion of seedling plants. Root-stocks of Arrow-head, *Juncus*, Bur Reed, Cat-tail Flag, Scouring Rush and others spread so rapidly in the ponds and bogs that they soon become mixed. We are planning now to give each species with this habit a small bog to itself, where nothing can intrude and where it can hold full sway. In the fall of the year the large terminal buds of *Myriophyllum* and Bladderwort sever themselves from the parent plant and sink to the bottom to rise the next spring and drift away from home, starting many new colonies. We hope to provide for keeping these plants within bounds in a similar way.

In the place where we wished to grow the Mints, Pulse family and a few others the ground was rather too hard. We covered the soil with about six inches of sand, which serves as a mulch and works easily. We have a dry sand bank sloping to the south which grows species of *Sedum*, *Cacti*, *Tanacetum Huronense*, *Solidago rigida* and a few other things to perfection. We are doing pretty well with species of Gooseberries and Currants, Sedges, Viburnums Hawthorns, Willows, Honeysuckles, Composite, Grasses, and weeds. We grow the last two lots in a formal way, each occupying about five by six feet, with a narrow grass path between.

In the older portion of the garden the paths consist of a little gravel and loam, with borders of small field stones; in the newer portion the paths consist of well-mown grass. All weeds of much size, if any are found, are carried away to the rubbish-pile. In this way, after about three years, all those which are troublesome come from seeds of plants in cultivation.

By doing much of the spring work the fall previous, such as transplanting, weeding, etc., one man with a little help tends the whole three acres alone, and this without any opportunity to use a horse-cultivator.

W. J. Beal.
Agricultural College, Michigan.

Foreign Correspondence.

London Letter.

CRINUM ROOZENIANUM.—This was described as a new species by Mr. J. O'Brien in 1891 (*Gardeners' Chronicle*, ix., p. 701), when it flowered in the rich collection of Sir C. Strickland, at Malton, in Yorkshire. It was introduced from Jamaica by Messrs. A. Roozen & Son, of Haarlem. A plant of it is now in flower in the Palm-house at Kew, and by its side, also in flower, are plants recently brought from Jamaica by Mr. A. Worsley, who proposed for it the name of *Crinum Jamesense*, suggesting at the same time that it might be a white form of *C. erubescens*, which is common in tropical America. Mr. Baker says it is the *C. erubescens*, var. *minus*, of Herbert, a bad name for it anyhow, as it is the most robust and handsomest in flower

of any *C. erubescens* known to me. The largest of the Kew plants has about a dozen stout leaves nearly a yard long and four inches wide; a stout erect scape two feet long, bearing an umbel of eight flowers, all open together; tube seven inches, segments five inches long, the latter three-quarters of an inch wide, spreading and recurved, pure white; filaments curved upward three inches long, crimson; anthers yellow, odor very powerful and fragrant. The plant produces offsets very freely.

HIPPEASTRUM BRACHYANDRUM.—Permit me to again call the attention of those of your readers interested in bulbous plants to the merits of this comparatively new and, as yet, scarcely known Amaryllid. It is now established in a cold frame at Kew, where it grows and flowers freely, produces offsets abundantly and ripens seeds every year. It is now flowering, its scapes being a foot long, each bearing a trumpet-shaped flower not unlike a Belladonna Lily in form and color, but a little less in size. A batch of seedlings shows flowers in which the blackish red blotch at the base, characteristic of the type, is absent, the base of the segments being green. This may be taken as evidence that the plant is likely to "sport" under cultivation. There is a figure of the type in the *Botanical Magazine*, t. 7344. It is a native of Buenos Ayres. In places where the Belladonna can be grown out-of-doors it would be quite at home; indeed, it lived through the winter of 1892-93 in a border against a south wall at Kew, but the following winter proved fatal to it. In general behavior it may be likened to another and much older, but horticulturally neglected bulbous plant, namely, *Zephyranthes carinata*, which thrives under the same treatment as suits the Hippeastrum.

IRIS HARTWEGII.—Mr. Gerard may be interested in hearing what progress has been made at Kew with this species (see p. 287), of which he sent fresh seeds in December last. They were sown at once in a pan of loamy soil in a stove, and as soon as the seedlings were strong enough they were pricked off into other pans and then gradually hardened off. In May they were planted in a bed of rich soil in a frame facing south, and since June they have been left exposed to sun, air and rain, night and day, being supplied with water in dry weather. They are now healthy plants, each having about half a dozen leaves fifteen inches long, and a tuft of long fleshy white roots, suggestive of strong Asparagus crowns. Nothing could be happier or more promising, although the treatment so far has been the reverse of that described by Mr. Gerard. The Kew plants ought to flower next year.

MYOSOTIDIUM NOBILE.—The best specimens I have ever seen of this interesting Boragewort from the Chatham Islands, near New Zealand, were in the garden of Mr. Enys, at Enys, Penryn, Cornwall, where the conditions appear to suit it exactly. It has been a specialty in the garden of Sir E. Loder, at Horsham, for some years, and I believe it flourishes in the open air in Mr. Gumbleton's garden in Queenstown. It first flowered in England about forty years ago, but it has never become a general favorite among growers of herbaceous plants because of its miffliness. It has a thick prostrate root-stock, a tuft of glossy green heart-shaped leaves about nine inches in diameter on stalks about a foot long. The flowers, which are borne in a loose corymb on an erect scape a foot long are nearly as large as common Primroses, and colored two shades of blue. Flowering plants can be grown in two years from seeds. Mr. Enys writes: "I have succeeded with this plant by growing it in the open air under a south wall, planting it about a foot deep in sea sand and covering it with mats in winter. Thus treated it produces leaves a foot across and just short of three feet in height, with large heads of flowers. It ripens seeds abundantly here. I saw it growing in pure sand in the Chathams."

CAMpanula VIDALII.—When well managed this is one of the very best plants for the conservatory. Mr. Poë, an amateur, who devotes his garden chiefly to the cultivation of uncommon, but attractive, plants—neglected beauties,

one might call them—exhibited this week a group of examples of this *Campanula*, which secured a first-class certificate and the admiration of all who saw them at the exhibition. They were in nine-inch pots, the stem about a foot high, with a head of horizontal branches clothed with glossy green foliage, and the flower-scapes were a yard high, each plant having about six scapes, and each scape bearing about a score of pure white waxy-looking bells which hung gracefully from near the top. To manage it properly, this *Campanula* must be raised from seeds and grown on year after year; cuttings never make nice specimens. When about four years old the plants are at their best. The branches of this year develop into the flower-scapes of next, a new set of branches springing from the top of the stem every year. The plants will not bear frost. This species is remarkable in being found wild only in the Azores. It has been in cultivation about forty years.

CLERODENDRONS.—Mr. Orpet inquires (see page 288) if there is a Clerodendron in English gardens which answers to the description of the plant he knew fifteen years ago as *C. squatum*, and which was a stove climber, with dark green leaves and bright red flowers produced in winter. No doubt, the plant meant is *C. splendens*, which was introduced from Sierra Leone about forty years ago. It is in flower at the present time in a stove at Kew; indeed, it is rarely without flowers at any time of year. The panicles are from six inches to a foot across, and the flowers are of a rich blood-crimson color. A hybrid between this species and *C. Thomsonæ* (*Balfourii*) was raised about twenty-five years ago and distributed by Mr. W. Bull. It differs from both parents in having the calyx colored dull red and the corolla of a deep crimson color, and, although not as effective as either, it is, nevertheless, a good, free-flowering, attractive stove climber. There are fine examples of it in flower now trained against the rafters in the stove at Kew. I have seen this plant doing duty for *C. splendens*. The other plant referred to by Mr. Orpet—namely, *C. squatum*—is our old friend, *C. Kämpferi*, under another name. It is one of the most useful of stove plants, being easily grown in pots, and with a little management it may be had in flower all the year round. We grow it from spring-struck cuttings in a sunny frame during the summer, removing it into a warm house in October, when it flowers all through the winter, odd plants flowering at other times. It is a native of various parts of India as well as China and Japan, and is one of the most widely cultivated of garden-plants.

London.

W. Watson.

Entomological.

Another Herbarium Pest (*Ephestia interpunctella*).

IN the early part of the present century the naturalist Hübner published, in his *Sammlung europäischen Schmetterlinge*, a description of a little moth under the name of *Tinea interpunctella*. This insect does not appear to have been noticed or to have attracted any attention in this country until about forty years ago. In his *Second Report of the Insects of New York*, published in 1856, page 320, Dr. Asa Fitch described the insect as a new species under the name of *Tinea zeæ*, or Indian Meal Moth, and he stated that its larva was particularly troublesome to housewives by destroying the cakes used in starting fermentation in dough, these cakes being largely composed of Indian meal. It proved to be the same species described by Hübner, by more recent entomologists classed under the genus *Ephestia*, or sometimes under *Plodia*. It may have been introduced from Europe, although this is by no means clear, as it is known to have a wide distribution on this continent. Four years after the description by Fitch, the late Brackenridge Clemens, in the *Proceedings of the Academy of Natural Sciences of Philadelphia*, 1860, p. 206, stated that the larva was a frequent inhabitant of houses and "feeds on a variety of dry goods, rye, corn, clover seed, on garlic heads, preserves, especially those

contained in jars. The seeds are bound together with a silken web in which galleries are left."

The late B. D. Walsh, in the *Practical Entomologist*, vol. ii., July, 1867, p. 110, calls it the Peach Worm, and says that dried peaches are often so much infested as to become worthless. His observation of it was probably made in Illinois, where he then lived. He also states that the larva was considerably preyed upon by a small Ichneumon-fly and by Chelifer oblongus, Say, a small scorpion-like spider.

In the *American Entomologist and Botanist* for December, 1870, p. 374, Professor C. V. Riley notes that a correspondent in Springfield, Illinois, found the larvæ living in old beehives and eating bee-bread and detritus, and also observes that the insect has been bred from dried roots of Dandelion.

In 1880, the same author, in the *American Entomologist*, vol. iii., p. 229, answers inquiry and specimens received from West Boylston, Massachusetts, where the larvæ were found in a sack used to hold oats, corn, meal and "shorts." In his answer, Professor Riley says: "This worm is almost omnivorous and feeds with equal relish on all sorts of dried animal and vegetable substances, being, however, particularly fond of grains and fruits. We have found it quite injurious to old English walnuts and pecans, the larva always eating out at the suture at the base of the nut before spinning its cocoon. It is likewise to be found in cinnamon bark, while if it once gets into a cabinet of insects it does much injury by feeding upon the mounted specimens. It also injures old books that are not often handled. It cannot, of course, multiply in grain or meal that is kept well protected and fresh, or in sacks that are in constant use." In *Insect Life*, vol. ii. (1889), p. 171, Professor Riley gives the figure which is reproduced on this page, and says of the insect: "We first raised it upon wheat at St. Louis, in October, 1870. Larvæ have been sent to us from a meal-sack at Boylston, Massachusetts; we have reared it from corn from Guatemala; larvæ and moths were received from a firm of manufacturing chemists of Detroit, Michigan, who had found them crawling about over sacks containing roots of Dandelion—moths, in fact, being found in the bags; we found numerous larvæ infesting wheat in the Atlanta Exposition building in 1884; large numbers of larvæ were also found in a jar containing Chickasaw plums at the same exposition; larvæ were received from Ripley, Mississippi, on two occasions in 1885, some of which were said to have been found feeding on sugar in barrels; one specimen was bred from dry Opuntia from Texas; larvæ were received from Detroit, found among old books; larvæ of all sizes were found infesting Pecan nuts in St. Louis, in September, 1872; moths were bred by Dr. A. W. Hofmeister, in Iowa, from cinnamon bark; moths were bred from English walnuts in St. Louis in 1876, and the species in all states was found abundantly in a wheat warehouse in Alexandria, Virginia, in 1883."

It has been found infesting stored seeds of Lettuce in New Jersey, and at the Arnold Arboretum it has been destructive to the dried seeds of many trees and shrubs. From the foregoing records of its habits it is not strange to find *Ephestia interpunctella* in the rôle of a herbarium pest. During the past three years the larvæ have been quite troublesome among dried herbarium specimens, particularly among the duplicates, at the Arnold Arboretum. The flowers and fruits are especially liable to damage, and are sometimes completely eaten, excepting the very hard or stony parts, and young leaves are also often destroyed. If, on drying, such fruits as nuts crack a little, the larvæ easily gain entrance and eat out the interior. Thus far the pest has chiefly troubled the dry fruits and unprotected duplicates of herbarium specimens, and the evidence of its ability to destroy has been so well marked as to induce precautions for protection and preservation. Herbarium specimens treated with a solution of corrosive sublimate do not appear to have been much affected by the pest, but further experience must be had before it can be proved that

this remedy is as useful against the *Ephestia* as it is esteemed to be in preventing the ravages of other kinds of herbarium predators.

The larva or worm is of a pale or dull white color and about half an inch long when fully grown. It has a brownish yellow head and brownish patch close behind it, and the body is dotted with microscopically minute dark-colored spots, from each of which arises a hair. A more or less abundant mass of silken threads is usually spun among the fragments of grains or other substance upon which the larvæ have been feeding. Upon attaining full growth the larva forms a slight loose cocoon of dull white silk, generally in such places as in the folds of cloth, between contiguous objects or in any place where some slight concealment or shelter is afforded, and where it changes to a slender pale yellowish or brownish yellow chrysalis from one-fourth to one-third of an inch long.

The little moth which comes from this chrysalis is a slippery little creature, which, when walking, makes frequent little skips or jumps, and when at rest with folded wings it averages about three-eighths of an inch in length from head to tip of wings. The wings expand from about half an inch to nearly two-thirds of an inch across when fully expanded, there being a noticeable variation in the size of the moths. The moth may be readily identified by the basal or inner ends of its front or upper wings being of a yellowish white or dull cream color, while the outer ends for considerably more than half the length of the wings are of an indistinct reddish gray, a magnifier showing some irregular blotches of a dull tawny color.

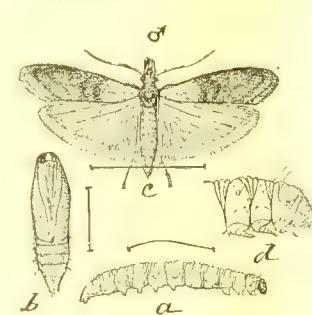


Fig. 45.—*Ephestia inter punctella*.
a. Larva. b. Pupa. c. Moth. d. Head and thoracic joints of larva, all enlarged.

The hind or under wings are white, with a somewhat satiny glossy lustre. There appear to be two or three broods of this insect during a single season, and the broods seem to overlap more or less. In a warmed room the moths may be found flying as early as February, and from this time onward throughout the spring and summer individuals may be found at almost any time, but, of course, in greatest abundance at the periods when the majority of the moths of each brood are developed, these seasons apparently being about the months of May, August and October.

Benzine or naphtha applied with a small hand syringe or sprinkler will kill every larva with which it comes in contact, and it possesses the advantage of evaporating quickly and leaving no discoloration. An interesting little ichneumon, *Habrobracon honestor*, has been found parasitic upon the larvæ.

The accompanying illustration is from a cut loaned by the Department of Agriculture.

Arnold Arboretum.

J. G. Jack.

New or Little-known Plants.

Opuntia fulgida.

OPUNTIA FULGIDA, generally known throughout the south-west under the name Cholla, is one of the most interesting plants on the Tucson plains. This remarkable Cactus evidently reaches its greatest development in southern Arizona, where it not infrequently attains a height of fifteen feet, with a trunk from eight to twelve inches in diameter. (See figure, page 325.) It is strictly a plains plant, being seldom seen on the foot-hills or mountains. In Arizona its range extends as far north as the great rim which separates the Colorado plateau from the southern plains, and from here it extends southward deep into Mexico. In this territory it is confined almost entirely to Pima, Maricopa and Pinal coun-

ties. To the south-west, in Cochise County, its place is taken by *O. Bigelovii*, a somewhat similar, but usually much smaller, plant, which is also known under the name Cholla. To the north and north-west it gives way to *O. Whipplei*, which is the only cylindrical *Opuntia* found in Arizona, to any great extent, on the Colorado plateau. To the west, in Yuma County, it is no longer found, but in its stead we find *O. echinocarpa*.

Opuntia arborescens, a tree of much wider dissemination, and the small *O. leptocaulis* grow throughout the entire country occupied by *O. fulgida*. *O. arbuscula*, *O. acanthocarpa*, and occasionally large numbers of *O. Bigelovii* are found mingled with this plant north and im-

Mountains and to the east, along the Mexican border, are more broken and considerably higher than the Tucson plains, which probably accounts for its presence there. It grows in great numbers on the southern foot-hills of the Santa Catalina Mountains, while a few miles farther south, across the Rilito River, on the open plains, are growing the finest specimens of *O. fulgida* that I have ever seen. Last fall I made an extended examination of these plants, and traced all the variations to be found in a trip from the plains into the foot-hills. Although the two forms appear quite different in the different localities, where they intermingle it is out of the question to separate them. The flowers of both are of the same size, appear during July

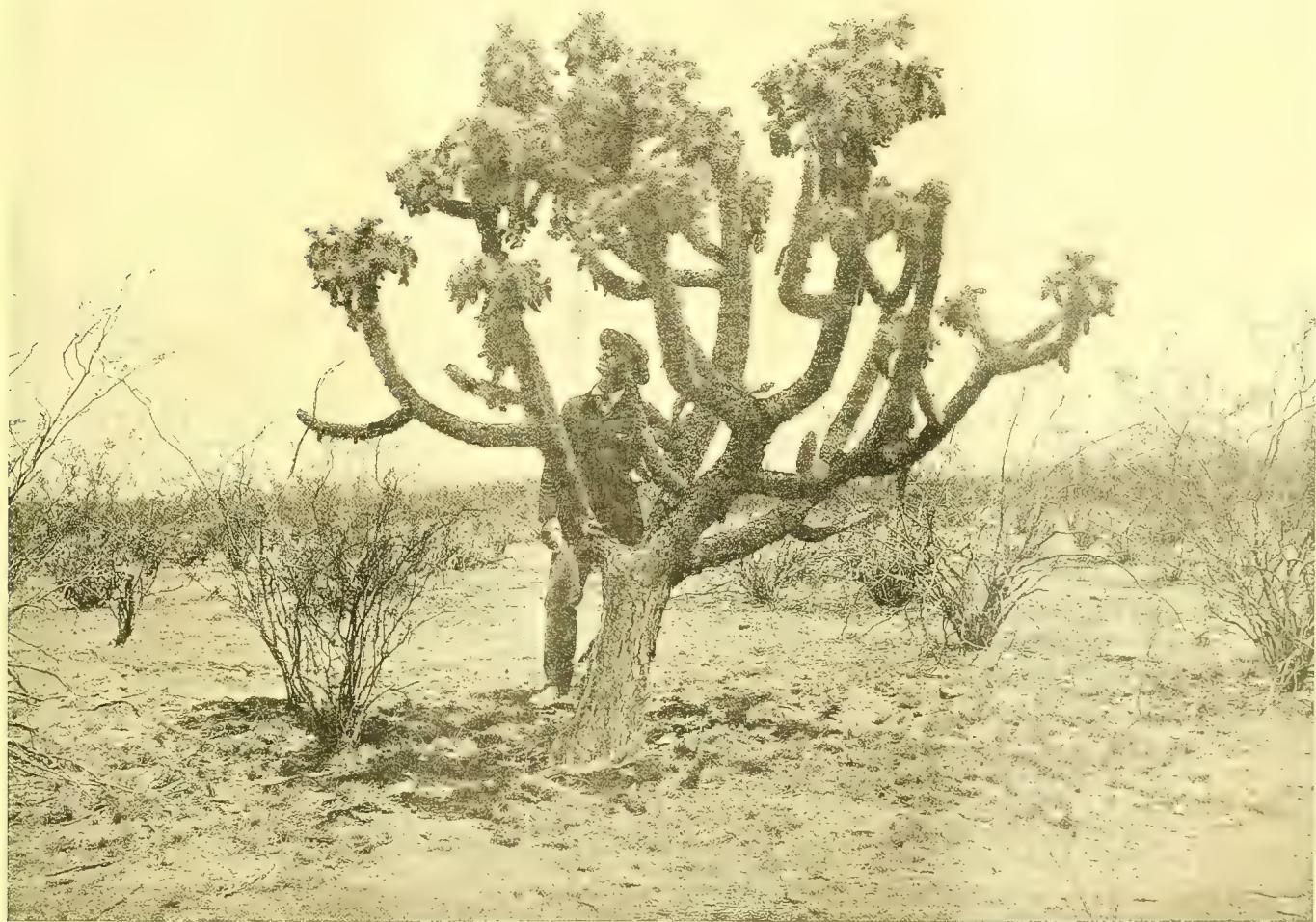


Fig. 46.—*Opuntia fulgida* in Arizona.—See page 324.

mediately south of the Salt and Gila rivers, while in the foot-hills and mountains throughout the south and central portions of its range are found *O. versicolor** and *O. mamillata*.

Opuntia mamillata is closely related to *O. fulgida*, and I seriously question whether it is separable from it as a valid species. It was described from material collected south of the Baboquivari Mountains, in the direct range of *O. fulgida*, and in the original description the characters apply almost equally as well to the latter species. The typical *O. mamillata* grows on low mountains, foot-hills and higher elevations than *O. fulgida*, which is characteristic of the open plains. The plains south of the Baboquivari

and August, and are the latest of the cylindrical *Opuntias* to bloom. The petals of both are bright pink, fading to purple; few in number and strongly deflexed. The deflexion of the petals is a character, so far as I have observed, common to but one other species of the cylindrical *Opuntias* found in Arizona—*O. leptocaulis*. †

The fruit of the plains plant is a little more spherical than that common to the typical *Opuntia mamillata*, and the tubercles are a little more prominent. These characters are by no means constant and of no value in establishing a specific distinction. In both the fruit is very proliferous, does not ripen until the following spring, and frequently

* This is a manuscript name of Dr. Engelmann's, which was never published. It represents a valid species growing in abundance on the low mountains of southern Arizona.

† In vol. vi., *Botany of the Wheeler Survey*, page 132, it is stated that the flowers of this plant, like those of the rest of the genus, are diurnal. So far as this plant in Arizona is concerned, this statement is denied. The flowers open about four o'clock in the afternoon and close shortly after sunrise the next morning.

remains hanging to plants until midsummer. Ripe fruit and flowers are frequently seen on a plant at the same time, this being true of quite a number of our cylindrical Opuntias; *O. versicolor* sometimes retains its fruit for two years or even longer. In both the proliferous fruit hangs in large pendulous clusters from the extremity of the branches. Many of these fruits, more especially those which develop from the tubercles of other fruits, are sterile, or have but few seeds. They are easily detached, and when they fall to the ground the moisture in them is sufficient to enable them to take root and in time form a new plant. The twenty or less small pulvilli on the ovary bear a few scattered spines, which usually fall off as the fruit matures. The young joints are easily broken off and cling like formidable burrs to anything with which they come in contact. The joints carried about in this manner by various animals finally drop off, take root and produce new plants, this being the principal method of dissemination.

The most conspicuous differences between the two plants are in the relative plumpness and diameter of the terminal joints, the tumidity of the tubercles, and the number and length of the spines—differences which depend to a great measure upon locality. Three years ago a specimen of *Opuntia mamillata* was brought from the foot-hills north of Tucson and set out in the Cactus garden at the university. Each year this plant more nearly approaches the plains plant in appearance; the spines are becoming more numerous and longer, the joints smaller and the tubercles less prominent. From my observations I conclude that *O. mamillata* is at most but a variety of *O. fulgida*.

University of Arizona.

J. W. Toumey.

Plant Notes.

SOPHORA JAPONICA.—The few well-grown specimens of this tree now in flower in Central Park attract much attention, partly due to the fact that no other good-sized trees are in bloom at this late season, but their abundant, cream-colored, pea-shaped flowers would be striking at any time. These flowers, which are produced in loose panicles at the ends of the branches, are not as large as those of the Clammy Locust, but they continue to open for two or three weeks. This late production of abundant and lasting flowers is only one of the merits of this tree; however. It is perfectly hardy in all our north-eastern states, although it does not ripen seed. In form it has a broad, round head, and the dark green color of its younger branches also adds to its effective appearance. When grown in a well-drained, rich soil, its foliage is a deep lustrous green, and it remains on the tree looking clean and fresh until late autumn. In an early volume of *GARDEN AND FOREST*, Mr. Nicholson described a specimen of this tree at Kew, which was one of the three or four plants first brought into England. It is fifty feet high, with a spread of seventy-five feet and a trunk circumference of nearly fourteen feet. The specimen in Syon Park, as described and figured by Loudon, is still larger. None of the trees in this country, so far as we know, have reached this size, but there are many good specimens still growing, and it is one of the peculiarities of the tree that the older it gets the more floriferous it is. Altogether, it is one of the very best of medium-sized exotic trees for ornamental planting in this country. In spite of its specific name, this *Sophora* is really a Chinese tree which has been introduced into Japan, where it was first found by European botanists, and from which country it has been distributed among the parks and gardens of the western world. There is a weeping form of the species which grows into very picturesque shapes.

RHUS COPALLINA.—This is the so-called Dwarf Sumach, one of the commonest of our native shrubs, sometimes hardly more than a foot high, and again, in richer soil, eight or ten times as tall, while in southern Arkansas and Texas it becomes a tree thirty feet high, with a trunk diameter of ten inches. It is flowering now, considerably later than the Smooth Sumach, which was preceded in

bloom by the Stag-horn Sumach. Neither the flowers nor fruit are as conspicuous as those of the Stag-horn Sumach, but the male flowers continue to open in succession for three or four weeks, and long after those of the fertile plant have fallen. The fruit ripens to a dull red in autumn, and sometimes to a bright crimson. The chief beauty of the plant, however, is its graceful habit, and more especially its bright glossy foliage. The leaflets and the wing-margined stalk have more substance than those of the other species of this section of the genus, and, unlike them, they are a lustrous dark green on the upper surface. In autumn they change to a deep crimson color, which is retained for a long time. These plants add much to the beauty of rural roadsides, and they could often be used with striking effect in parks and private grounds. In Glen Island, a pleasure resort near this city, where there is a large collection of well-grown tropical and other plants, an interesting feature is a mass of these plants at the base of a cliff and connecting it in an attractive way with the turf below.

EUPHORBIA COROLLATA.—This is, perhaps, the most beautiful of the numerous hardy Euphorbias, of a light, elegant habit, and when well grown it forms broad, bushy specimens covered with numerous white corolla-like involucres. The flowers are apetalous and greenish. The five petaloid bracts are about a quarter of an inch long. The involucrate flowers are very numerous and disposed in large-branched and somewhat leafy cymes. This species is quite hardy and will grow well in a rockery or in a border of ordinary soil. It flowers throughout the hottest summer months and is one of the most valuable hardy perennials for hot and dry positions. It is also useful when cut to mix with other flowers and adds an element of lightness and grace which is most desirable.

DRACÉNA SANDERIANA.—This is a very distinct and remarkable form with erect leafy stems and lanceolate, rather short, leaves. In habit it is quite unique among the numerous species of Dracæna. The leaves are about four inches long, of a glaucous-green, edged and striped with broad bands of milky white. It has a tendency to grow very tall, but comparatively compact specimens with two or three stems can easily be grown. If the tops are removed as soon as the stem becomes woody two or three shoots will generally appear instead of the one removed. Propagation by means of top-cuttings is quite easy. The ordinary method of Dracæna propagation also answers well. Good fibrous vegetable soil, with some addition of old mortar, seems to be most suitable. This is a very attractive plant for table decoration and for general indoor use.

BOUGAINVILLEA SPLENDENS.—This species is a very valuable greenhouse climber, superior in many respects to the old and well-known *Bougainvillea glabra*. It is of a bushier and more compact habit, and the foliage is a richer and deeper green. The inflorescence, a large, leafy panicle, is larger and more showy than that of *B. glabra*, with numerous bright crimson bracts and tubular yellowish flowers. The leaves are ovate-lanceolate, acuminate, tapering to a short, broad petiole, and deep green in color. *Bougainvilleas* do well either in pots or when planted out in a cool greenhouse in a well-drained border in rich loam of open texture. Trained under the rafters or on the wall of a conservatory, they are very floriferous and beautiful. Whether planted out or pot-grown, a partial rest should be given during the winter months. This will ripen the wood and insure a profusion of flowers the following season. *B. splendens* is easier to propagate than most other species. Cuttings of young, almost ripe shoots will root in about three weeks in a slight bottom-heat.

Cultural Department.

Summer-flowering Plants.

Clerodendron fallax.—This is the best of the shrubby varieties of *Clerodendron*, and its bright scarlet panicles of flowers are a welcome addition to the stove-house during July and August. *C. fallax* propagates readily here from soft-wood

cuttings in a bottom-heat of seventy-five degrees and soon grows into a fair-sized plant. The large cordate-ovate leaves are dark green and the plant is erect in habit. A compost of two-thirds loam, one-third leaf-mold, with a dash of sharp sand and a little dried cow-manure well pulverized, seems to suit it. Mealy bug is partial to this plant, for which a well-directed force of water from the hose is the best remedy. Failing a good water-supply, hand-sponging must be adopted. During the winter months the plants should be kept moderately dry at the roots. The end of February is a suitable time to repot them.

Pleroma macranthum.—During July and August, when greenhouse flowers are comparatively few, the beautiful rich violet-purple flowers of *Pleroma macranthum*, or *Lasiandra macranthum*, as it is also frequently called, are sure to command attention. Although the individual flowers last but a brief period, the plants continue to bloom for several weeks, and a bushy plant in good flower is a beautiful object, its color being distinct from that of any other indoor plant. The propagation of this species is of the easiest possible nature. Cuttings inserted in a moderate bottom-heat in early spring will be well rooted in about ten days, and if potted on and pinched as required they will make neat plants by flowering time. *Pleromas* are seldom or never troubled with insect pests.

Allamanda Hendersonii.—This is much the best summer-flowering greenhouse climber; although blooming earlier and more continuously in a stove temperature the flowers lack the size, substance and fine clear yellow color of those grown in a cooler structure. From July until November the plants are smothered with bloom; from November until early in March we give our plants only sufficient water to keep them from shriveling, pruning them back well before starting them into growth. Well-established plants stand liberal feeding, and a mulching of well-rotted manure after scraping away some of the old surface soil will be appreciated. From soft-wood cuttings rubbed off with a heel and inserted in a sharp bottom-heat, Allamandas are readily propagated, and they are not specially fastidious as to compost so long as it is of a generous nature. This season we tried a couple of small specimens planted outdoors in a well-enriched border which gets the sun nearly all day long. The plants have made excellent growth and flowered freely. The flowers are rather more bronzy in hue than when grown under glass, but are equal in size to any greenhouse specimens.

Taunton, Mass.

W. N. Craig.

Notes on Crinums.

CRINUM PEDUNCULATUM, now in bloom, is a good example of the star-flowered section of these plants. Crinums differ materially, but may be divided broadly into two sections. Firstly, those with columnar leafy bulbs, evergreen leaves, and flowers with narrow strap-shaped petals forming star-like flowers; and, secondly, those with round or ovoid bulbs, leaves deciduous generally and usually drooping flowers, which are somewhat bell-shaped, with broad petals. *C. pedunculatum* has a bulb a foot or so in length, made up from the bases of the long wide leaves. Like all Crinums, it requires warmth and moisture in the growing season, and flowers usually at this time, the thick peduncle springing from between the leaves and bearing numerous flowers—eighteen or more. These are white, star-shaped, with upright purple stamens, capped with brown anthers, the petals being narrow, channelled and recurved. On the whole, this is a quaintly effective plant.

The species are rather numerous, and while they all have certain merit, *Crinums Moorei* and *Powellii* are, beyond doubt, the two most beautiful and valuable. *C. Moorei*, with its large round bulb, long narrow neck and wide-spreading leaves, is a very striking plant in the garden at any time. It blooms with some regularity, having flowers of a most beautiful shade of pink, of large size and fine form. *C. Powellii* is a hybrid between *C. Capense* and *C. Moorei*, and seems to be hardy here in a sheltered location without other protection, as it has stood out two years. Last winter, being unusually severe, was a good test for uncertain bulbous plants, and finished up *C. Capense*, which, to my thinking, was not a great loss from the garden. *C. Powellii* has leaves dark green and some three feet long at this time, the bulb showing only a short neck. Later it will bloom with handsome pink flowers on tall stems. There is also a white-flowered form. With deep, well-worked soil and generous cultivation this forms a noble plant which will prove a treasure and ornament in any garden. The Crinums with striped flowers, of which *C. Kirkii* is a popular example, do not seem to me entirely satisfactory,

the reddish stripes usually being of a dull, unsatisfactory hue. They are easily grown and tenacious of life if kept in a warm dry place in winter.

Elizabeth, N. J.

J. N. Gerard.

Two Good Kniphofias.

WHEN *Kniphofia pauciflora* was first described and figured in *The Gardeners' Chronicle* it was stated that it had flowered at the Royal Gardens, Kew, in May and again in September, and that, though it was not so gaudy as many of its race, it would be a welcome plant if its disposition to flower twice a year would be regular. Since the plant has become more plentiful it has, indeed, proved a perpetual-flowering one. Its principal time is April and May, but it comes on again by the end of June, and for a third time in September. It has narrow grassy leaves about a foot long; the flower-stalks, which come two or three from the same plant, reach a height of two feet, and the loose spikes, about six inches long, droop gracefully; the color of the flowers is a bright citron-yellow. *K. Natalensis* was not thought much of when it made its first appearance. The color of the spikes was greenish red and dull. I have, however, found a few plants among a lot of 500 which had very bright-colored flowers, and which have improved since. The spike and flowers differ distinctly in shape from other species. The spike is loose, very narrow, about one and a half feet long, the flower slightly recurved and scarcely showing the mouth of the corolla. The color is a mixture of brick-red and rose, and is very striking. Both *K. pauciflora* and *K. Natalensis* are well worth having.

Max Leichtlin.
Baden-Baden.

Hardy Perennial Plants.

OUR native purple Cone-flower, *Echinacea purpurea*, has been pronounced by English authorities as one of the stateliest and most effective composite plants which this country has given to European gardens, and, really, with its profuse and lasting flowers, its strong and vigorous growth, it is always a striking plant in the perennial herbaceous border. There is no reason why it should not be abundantly used, for it grows readily from seed. Its flowers are large; its dark-colored disks are somewhat conical in shape, giving the plant its common name, and the rose-purple rays which droop from it are two inches long.

Another showy native plant which is now in bloom is the Crimson Balm, *Monarda didyma*, a perennial of erect habit, which reaches a height of three or four feet when it is well grown, and bears bright red flowers. Although not often seen in gardens, this is a familiar wild flower in some of our middle states, where, along the shaded banks of streams, it often covers large areas. Under good cultivation in rich soil it reaches a much larger size than it does in its native habitat, and its Mint-like fragrance and glowing color make it attractive anywhere. Large masses of it are especially striking at this season. Other native species of *Monarda*, with purplish flowers, like *M. fistulosa*, or with bracts stained with purple and yellow, like *M. punctata*, are good plants for the hardy garden, but less striking than the Crimson Balm, which is also known as Bee Balm and Crimson Bergamot.

The perennial Sweet Peas, *Lathyrus latifolius*, seem to be somewhat neglected now, perhaps because of the popularity of the annual flowering Peas. But, although the perennial species lack fragrance, they are exceedingly valuable plants for cutting, especially the variety *Albus*, which often carries half a dozen flowers as white as snow on a single stem. The variety *Splendens* should not be confounded with the beautiful California species, *L. splendens*, which has never proved happy in eastern gardens. This variety cannot be trusted to come true from seed, but when propagated from cuttings it can be easily reproduced. It resembles in habit the white form, and its flowers are much brighter in color than the ordinary rosy purple ones.

A plant which has proved perfectly hardy with me, although classed in the books among half-hardy perennials, is the so-called Whorl-flower, *Morina longifolia*, a native of the mountains in Nepal. The leaves are narrow, deeply cut and armed with thistle-like spines. The tubular flowers are at first white, changing to deep crimson, borne in whorls and forming a long leafy spike. The glistening leaves and the varying color of the flowers give the plant a very distinct appearance, and it will always attract notice, even in a choice collection of hardy perennial plants.

A more modest plant is *Micromeria (Melissa) rupestris*, a half-shrubby perennial, which, in this climate, dies to the ground every winter, but throws out numerous partially pros-

rate stems in spring, which rise at the extremities and bear many small labiate flowers produced from the axils of the leaves. They are white, with rosy-purple markings on the inner side of the petals, and are borne in succession from July until heavy frost. This *Micromeria*, with its distinct fragrance and taste of Pennyroyal, is a first-rate plant for the rock-garden. It is propagated by seed or by division of the roots in spring.

Stamford, Conn.

S. A.

Cucumber, "Cool and Crisp."—This is an excellent variety in every respect. It has been grown for three seasons and shows many qualities that make it valuable. Chief among these is hardiness and vigor of habit, in which it excels the justly popular Early White Spine. The vine is always healthy and strong, and this enables it to bear up against drought, and in a large measure also against stem-boring insects. The fruit is fully as large as that of Long Green, and is much more symmetrical in shape, being slightly curved and tapering gradually at both ends. It contains very few seeds, as few as any variety I have grown, and is most delicate in flavor. In a word, it is much like an English frame cucumber in form and fully equal to it in flavor. Its value as a market variety remains to be tested by experience, as it is not yet generally known, but beyond all doubt it has no rival for the private garden.

Bloomfield, N. J.

W. R. S.

Correspondence.

The Rose Garden on the Wooded Island, Jackson Park, Chicago.

To the Editor of GARDEN AND FOREST:

Sir.—The possibility of growing Roses in Chicago is fully demonstrated this year by the garden of Roses on the Wooded Island. The Roses were nearly all taken up at the close of the World's Fair, and these plants were mostly set out in the spring of 1894. The exceptions are some plants of Rosa rugosa, Moss Roses and Pride of Washington, that form the hedge enclosing the garden. The plants suffered last year from drought, but the water-supply on the Island has been increased and they have been properly watered this season.

Early in the winter of 1894-1895 all of the plants except those of Rosa rugosa and its hybrid, Madame Georges Bruant, Madame Plantier, the Moss Roses and the climbing Rose, Pride of Washington, were pegged down to the ground and well covered with leaves. The exceptions mentioned were protected with the same material at the roots only. The plants wintered, in the main, remarkably well, although the weather was severe. Probably they were helped by the snow that was much of the time spread over their leafy covering. But, as there was no snow on the ground at the time when the mercury reached the lowest point recorded, the hardiness of the Roses may be considered as fairly tested.

The Moss Roses, Madame Plantier and Rosa rugosa wintered perfectly, with no protection save at their roots, but plants of Pride of Washington were killed back to the covering of leaves, which in their case protected the wood trained along the lower of two wires that support the hedge Roses. All of the wood on the upper wire, which is stretched about two and a half feet above the ground, was killed, excepting in one or two places where the hedge is somewhat sheltered by trees and shrubs.

The garden is composed largely of Hybrid Remontants, and of these Mrs. John Laing is easily the best, proving hardy and vigorous and flowering freely. Although its first flowering was somewhat less abundant than that of Marshall P. Wilder, it has bloomed more continuously. As grown here, Marshall P. Wilder is entitled to second place as an all-round Rose. General Jacqueminot is nearly its equal, and Earl of Dufferin and Alfred Colomb are about as good. Following these comes a list of good varieties, all of which have proved satisfactory. They include Jeannie Dickson, Baroness Rothschild, Comtesse De Sereny, Paul Neyron, Anne de Diesbach, John Hopper, La Reine, Caroline d'Arden, Fisher Holmes, Jean Liabaud, Paeonia, Merveille de Lyon, Mabel Morrison and Prince Camille de Rohan. These all wintered safely under a covering of six to eight inches of dry leaves, made good growth when the covering was removed in late spring, and flowered well, many of them profusely, in June. Several varieties, notably Mrs. Laing, General Jacqueminot, Marshall P. Wilder, Earl of Dufferin, Merveille de Lyon, Baroness Rothschild and a few others are giving a good second crop, and other kinds show scattering blooms. No symptoms of mildew are apparent up to July 15th.

The beds are all covered with a heavy mulch of lawn-clippings, but all of the Honeysuckle-vines that were supposed to outline the beds have been removed, for they were found quite unmanageable, overgrowing and smothering the Roses. In fact, these and the rampant Verbenas that filled all of the space about and beneath the Roses last year, smothered to death as many Roses as were winter-killed. For this reason lawn-clippings now replace any living and growing mulch.

The Ramanas Roses have proved entirely hardy. This is also true of the Rugosa hybrid, Madame Georges Bruant, which is in flower continuously. Madame Plantier is also reliably hardy, and gives an immense June crop of flowers. So, too, are the Moss Roses, Comtesse de Murinâis and Captain John Ingram having bloomed the best.

In the Perpetual Moss class Salet and Blanche Moreau have proved most satisfactory. Pride of Washington is the best bloomer among the climbing June Roses, but it is not hardy unless all the wood is protected. Clothilde Soupert has almost disappeared from the garden. It is said to have frozen back badly, although turned down and protected. But all of the Polyantha class, as well as other low-growing Roses, were so smothered by the rank growth of Verbenas that they went into winter quarters with impaired vitality. This may in a measure account for the loss of Clothilde Soupert. It did admirably during the summer of the World's Fair, being among the last to succumb to mildew.

Gloire de Dijon, which is the strongest grower among Tea Roses, Reine Marie Henriette and Madame Pigney are the only sorts in this class that can be called hardy here, and then only when protected.

The Roses that have done least well in the Rose garden, and may, therefore, be deemed unsuited to the Chicago climate, are Margaret Dickson, which is the most vigorous of all the Remontants grown, but is parsimonious of its truly lovely flowers, and so is a disappointment. Her Majesty is also a strong grower, but does not flower well; Belle of Normandy is hardy, but does not perfect its flowers; La France froze back badly, but is sending up good shoots for late flowering; Francois Treyv   is a good grower and hardy, but the buds blight when they begin to open; Francois Levet is hardy, but many of its buds do not open; and American Beauty freezes back, refuses to grow, and is generally unsatisfactory as an out-of-door Rose in this climate.

Brighton, Ill.

Fanny Copley Seavey.

Luther Burbank's Hybrid Lilies.

To the Editor of GARDEN AND FOREST:

Sir.—The work of Luther Burbank in the improvement of plants and fruits by hybridization, cross-fertilization and selection is well known throughout the horticultural world. His work with Lilies began some eighteen years ago with a form of *Lilium pardalinum*, one of the native plants of this coast. It grows from British America to southern California, is very hardy, and increases rapidly by new bulbs from its rhizomatous root. It is found from high altitudes to the sea-level, usually in marshes on the banks of streams, or in deep, rich soil, and varies remarkably in size, form and color. In cultivation it takes readily to any garden soil, is very little subject to disease, and as easily grown as potatoes.

Some bulbs, of a form found near the Geysers, were first cultivated and the seed planted. Extreme types of these seedlings were selected and cross-fertilized. The same process was repeated several times. Several years ago I saw a field of Lilies, the result of this crossing, and the variety was wonderful. Every intermediate form could be found, from giants nine feet tall to dwarfs from six inches to a foot in height, while the flowers ranged in color from yellow centres and scarlet tips through orange to light yellow centres with pale red tips. These variations, although valuable in themselves, only formed a base for succeeding work, for when by repeated cross-fertilizations a form begins to break, it is more susceptible to the influence of the pollen of another species.

Using some of these varieties of *Lilium pardalinum* as pistillate parents, Mr. Burbank crossed upon them the following Lilies: *L. auratum*, many varieties; *L. Battelianae*, *L. Brownii*, *L. candidum*, *L. Catesbaei*, *L. Chalcedonicum*, *L. elegans*, *L. Humboldtii*, *L. longiflorum*, *L. Martagon*, *L. maritimum*, *L. Parryi*, *L. parvum*, *L. speciosum*, *L. superbium*, *L. tigrinum*, *L. Wallichianum*, *L. Washingtonianum*, *L. purpureum*. *L. Humboldtii* and some other Pacific coast Lilies were also used as the pistillate parents for a few thousand crosses.

Four years ago I saw the seed-pans containing these hybrids, then a year from seed. The little plants, numbering four hundred thousand in all, made a wonderful study in leaf variation.

These hybrids flowered last year, and the present season reached maturity. The field of three acres slopes gently to the east, the soil is a light sandy loam; in an air-line the distance to the Pacific Ocean is about twelve miles, and the air is tempered by daily ocean breezes. For moisture only cultivation is needed. In the field about one hundred thousand of the hybrids were in bloom on the fifteenth of June; a small portion had not reached maturity. It is needless to say that a richer mass of yellow, scarlet and gold could not well be imagined. Nearly all, unlike *Lilium pardalinum*, were fragrant.

Among so large a number of hybrids with so many violent crosses, freaks and monstrosities were to be expected, but, outside of a few exceptions, it can be said that all are symmetrical in form and beautiful in coloring. In form the range is from the closely recurved form of the typical *L. pardalinum* to a very flat flower, in which the petals approach the horizontal, a form which, so far as I know, was heretofore unknown among Lilies, and most nearly approached by *L. candidum* and *L. tigrinum*. Then there are many running into the trumpet forms, but none with the long trumpets of the *L. longiflorum* type.

In color the flowers range from the usual yellow or orange centre and scarlet tip of *Lilium pardalinum* to dark red on one hand and rich orange red, lemon, and a few white and pale lemon or straw-colored flowers on the other. Nearly all are spotted or dotted, many faintly, and some are clear lemon-yellow. The traces of all the staminate parents can be seen in the leaves and in the bulbs. My own examination and Mr. Burbank's information is that the result is equally various. In one particular it is especially notable and valuable. Mr. Burbank, I need hardly say, is a careful and successful grower, yet with very many of the Lily species he has the sort of success so many of us are too well used to. His bulbs dwindle away or suffer from disease until a few bulbs are all that are left to represent a plantation of hundreds. The hybrids, however, have inherited the strong constitution of *L. pardalinum* and its freedom from disease. In most cases, also, they inherit its tendency to rapid propagation. I also noted that hybrids of *L. Parryi* and *L. Humboldtii* show a vigor which neither parent possesses.

There is another and, doubtless, very potent reason for their vigor. In Mr. Burbank's work with Lilies the doctrine of the survival of the fittest has been carried out to an unusual extent. About two million seedlings have been grown altogether; in this last lot a hundred thousand are left out of four hundred thousand. There must certainly have been a pretty thorough elimination of the less vigorous seedlings. A healthier lot than the survivors would be hard to find.

In fragrance the seedlings rather follow the fragrant staminate parents than the odorless *Lilium pardalinum*. Practically all are fragrant, many exquisitely so. With a favorable wind the odor from these great Lily-fields can be perceived at a distance of five miles. To describe all of the variations to be found in this wonderful field would be impossible; to describe even the striking ones would require a volume, since scarcely any pair of plants are alike, and a thousand forms as distinct as named *Gladiolus* could be selected.

All are extremely floriferous, thirty to fifty flowers to a plant being common, and a few having over a hundred. One of the most curious forms was one in which *Lilium pardalinum*, var. minor, had been crossed with an unknown species. This might be called a Tree Lily. The bulb threw up many stalks. One of these branched about a foot from the ground into eight branches. The largest branch had forty-three blossoms, while the bulb bore two hundred and seven—this at six years from seed. An equally wonderful plant is a cross between *L. pardalinum* and *L. Wallacei*, which, at the same age, had thirty-seven stalks flowering. Many plants clearly show the influence of *L. elegans* in the very dark red flowers, and in the leaves of others can be seen the blood of *L. giganteum*. Crosses between *L. pardalinum*, var. minor, and *L. maritimum* are remarkable for vigor and very numerous fine flowers.

The cross on *Lilium pardalinum* gives a vigorous constitution, and with such vigorous hybrids of nearly every type Lilies must soon become the flowers of the people.

Ukiah, Calif.

Carl Purdy.

Iris hexagona.

To the Editor of GARDEN AND FOREST:

Sir,—Mr. Gerard's interesting article on American Irises in GARDEN AND FOREST of July 17th, suggests a word on *I. hexagona* in its natural habitat.

In *Gray's Manual* of 1890, *Iris hexagona* is given only in the appendix. I judge from that that it is a comparatively rare

plant. It is not plentiful here, and I have met with it in a wild state not above a half dozen times in twice as many years. This is the more singular, as under cultivation it is exceedingly robust and thrifty—single rhizomes set out eight years ago in garden soil, and twice subdivided since then, having grown into matted clumps four feet across. Grown in masses it is decidedly a showy plant, the color is so clear and bright, and the flowers so freely borne. All of our plants of this *Iris* have been grown in ordinary garden loam, in quite the reverse of wet soil, and have never been watered. Contrary to the usual belief, they have grown as well as in swampy land, and have endured several droughts uninjured.

Apparently this is a most variable species. We have in our collection of these plants three well-defined varieties. The one that most nearly answers to the type described by Gray is the most robust of all, and somewhat later to bloom. The flowers of this are large and showy, much larger than the second form of *I. hexagona* that came into my possession, a full shade darker, and the markings brighter and deeper. The third form, that Mr. Gerard has done me the honor to name *I. hexagona*, var. *La Mance*, is by far the best of the three. It is the earliest of all to bloom, and the large, wide-spreading flowers are from a third to a half larger than the flowers of the other two forms of the species in the same bed, and with the same treatment. The color is remarkably fresh and clear, a deep, rich blue, with darker shadings and white markings. A touch of yellow further enhances the general brightness. This plant was discovered last year in Benton County, Arkansas, just across the state line of Missouri. A semicircle of wild hills, half bluff, half woodland, was its home. Climbing from rocky step to step, we had clambered up from the valley below. Half-way up the mountain side ran a broad, heavy ledge of rock, and in a pocket-like dip of this ledge, so shallow that there was not more than six inches of earth above the naked limestone, were growing two dwarf, but thrifty-looking Irises. They were not in flower, but the situation was such a singular one for an Iris that we dug up all we could find, hoping it would prove to be a new species. Half of our little find we sent to Mr. Gerard for identification, and the other portion planted out in our own border. No special attention was given to it, and we were quite surprised at its remarkable size and beauty when it bloomed.

Pineville, Mo.

Lora S. La Mance.

Recent Publications.

In a Gloucestershire Garden. By Henry N. Ellacombe, M.A. London: Edward Arnold.

Every one who reads the current horticultural literature of England is familiar with the writings of Canon Ellacombe. The present volume consists mainly of articles which were prepared originally for *The Guardian*, although they have been somewhat modified in their permanent form. The first part of the volume is a garden calendar, each of its twelve chapters being devoted to the flowers of one of the months of the year, and there are fourteen other chapters on various garden subjects, such as Spring Flowers, Climbing Plants, Garden Walls, Palms and Bamboos, Parsonage Gardens and the like. Canon Ellacombe lacks neither imagination nor profound affection for his plants, and yet his writings never degenerate into sentimentalism. He has actual and accurate knowledge gained from close personal investigation, and this means not only the ordinary knowledge of the horticulturist and botanist, but that intimate acquaintance with all the ways and habits of plants which is only gained by one who takes a constant and affectionate interest in them in all stages of their growth. The purpose of the book is not primarily didactic, but as the story flows pleasantly on a great deal of genuine practical information is conveyed, along with many gleanings from rare old volumes that have a value purely literary or historical. Although the record is one of an English garden, the principles enforced are sound for all countries and climates, and the American reader will find it not only pleasant reading for midsummer days, but helpful and suggestive when he is studying what to do and what to refrain from doing in his own garden.

It ought to be added that the mechanical part of the book, its style of type, its illustrations and press-work are all of the very best quality.

Notes.

According to the *Journal of Commerce*, the first new evaporated apples from the south are already on the market, and also some small lots of southern sun-dried apples. New dried huckleberries are offered, to arrive, at nine and a half and ten cents a pound.

It is many years since sweet corn has been so uniformly good and free from worms as this season. Well-grown, evenly grained ears sell for twenty cents a dozen. Sweet Spanish peppers and Knob celery (*Celeriac*) are among new vegetables now coming from this section, and considerable quantities of asparagus still find sale along with more seasonable products, at twenty-five cents a bunch.

We have often called attention to the Spiked Loosestrife, *Lythrum Salicaria*, a plant which has become so thoroughly naturalized in damp places throughout all the north-eastern United States that most persons consider it a native. The plant has a tendency to vary, and some strains are superior to others, but the tall spikes of dark purple flowers, from four to six feet high, are always effective, especially on the borders of water, still or flowing, or where they can have a background of foliage. In parks and private grounds of suitable extent they are very useful and among the most striking of late summer-flowering plants.

The Geneva Experiment Station offers to distribute to persons in this state buds of the Lutovka Cherry, which was imported some twelve years ago by Professor Budd, of Iowa. The tree is of the Morello type, with firm fruit, of a sprightly acid flavor, about the size of an English Morello cherry, similar in size to that fruit, but with flesh not as dark. Professor Budd says that this Cherry is grown largely in Poland and Silesia as a roadside tree. It has been grown in Geneva for seven or eight years, and has proved very productive of fruit, which ripens as late or later than the English Morello. It has been grown to some extent in the west, and seems to be worthy of extended trial as a late sour cherry.

It has been for a long time held that chemical analysis of soils gives very little practical information as to their value. Dr. E. W. Hilgard, however, believes that it is time to abandon the denunciation of the so-called mistakes of Liebig, since his views are now being justified one after another, with the exception of his under-estimation of the need of nitrogenous fertilizers. Writing for the *American Agriculturist*, Dr. Hilgard says that a study of virgin soils has convinced him that certain characteristics ascertainable by analysis invariably translate themselves by definite effects upon natural and cultivated vegetation. The tendency of modern research is to the effect that cultural results run so closely parallel with those of analysis, that the results of the experiments with different fertilizers can be predicted from a proper understanding of the analysis.

According to the *Agricultural Gazette* of New South Wales, the true Opium Poppy can be easily and successfully grown in that country, where, in favorable seasons, the plant will flower in about fifteen weeks from the time of planting. As soon as the flower falls the capsule is slightly cut across one side in the afternoon to let out the milky juice. About four wounds are made. The next morning the milky juice will have hardened into a thin gum, which is scraped off with a blunt knife and transferred from the knife into a clean tin vessel. The unwounded side of the capsule is operated on the following afternoon. The collected gum or opium is made into thin cakes and carefully dried in the shade. The work of opium collection is one which can be done by careful women and children. When nothing but the seeds or heads are required the Poppy is planted broadcast and hoed out or thinned to a distance of nine inches apart. About 40,000 heads can be gathered to the acre, and when dried they are worth about five dollars a thousand. The seed is rich in oil, very nutritious, with an almond flavor, and is good food for consumptives. It brings twenty-five cents an ounce in Sydney.

The tornado which swept through Bergen County, New Jersey, three weeks ago did great injury to the well-known experiment-ground of Mr. Carman, editor of *The Rural New Yorker*, and every one will sympathize with the feeling of loss and desolation which is expressed in his description of the ruin so suddenly wrought among the beautiful groves and woods that made this rolling country so attractive. "We walk over to Emwood, our experiment-field," he writes, "and look about as one in a dream. We have note-book in hand, as in previous seasons, but there are no notes to take. They have

all been taken. The grove of Oaks, Chestnuts, Beeches, Maples, Birches and Tulip-trees, with its undergrowth of thousands of natural flowers and more than a thousand introduced shrubs and hardy herbaceous plants, so enjoyable and restful during the heat of the day, is now a mass of broken and splintered timber, kindling wood, huge roots, sections of trees that could not have been rendered more suggestive of havoc and ruin if they had been thrice struck by lightning." It is twenty-three years since Mr. Carman built his house and laid out the Rural grounds, and it is natural that he should feel attached to the place and to the surrounding country by many endearing associations. But the tornado has so changed everything that he declares it almost impossible for him to realize that it is the same country and the same home.

Seedling oranges continue to come from California by the car-load. Some fancy St. Michaels and Mediterranean Sweets from that state last week brought as much as \$3.70 to \$3.85 a box at the wholesale auctions, and the highest price reached by Rodi fruit, the popular summer Mediterranean orange, was \$2.60. With the end of the Mediterranean shipments of lemons at hand, fancy Majori fruit sold for \$6.75 a box last week, and anticipated advances may reach the extreme prices of a year ago when Rodi lemons sold here for \$7.62½. California fruit during the early part of the season sold so low as hardly to cover freightage, and a larger proportion of the fruit is now being kept at home to be dried and canned and made into wine. Sixty-five car-loads of California pears, plums and peaches were sold here last week, including also a few nectarines, early grapes and Seckel pears. The Georgia peach season is now past, and with the short supply from California, and the Delaware and New Jersey crops not yet marketable, those from North Carolina have brought exceptionally high prices. Baskets containing less than two dozen good Elbertas, on Monday, commanded \$1.00. The scarcity of this fruit from nearby states has also made a temporary rise in prices of Pacific coast peaches, the best of which now bring \$1.50 for a box six times the size of the Carolina package. Among the large variety of plums, Fellenberg, known also as the Large German, Swiss or Italian prune, is distinct and attractive. The form is oval and pointed and the color dark purple, enriched with abundant dark blue bloom. Another showy prune now frequently seen is the so-called Gros prune (*Grosse Prune d'Agen*, English Pond's Seedling or Hungarian prune). This fruit is very large, of a reddish violet color and suffused with bloom. Crab apples, large and showy, cost fifty cents for a ten-pound basket.

The *Boston Park Guide* is a compactly printed pamphlet of some seventy pages, with a full series of official maps and plans and a score or more of full-page illustrations, representative landscapes and structures in different portions of the park system. The work has been prepared by Mr. Sylvester Baxter, who was secretary of the preliminary Metropolitan Park Commission, and it includes not only a description of the parks of the central city, but those of the suburban municipalities which make up the metropolitan district, known as the Greater Boston. The entire area of these public reservations amounts to rather more than 14,000 acres. Few cities excel Boston in the beauty and variety of the landscapes which surround it, and perhaps no city in the world has taken such wise and comprehensive action to preserve so much of the characteristic scenery about it for the recreative requirements of its coming population. No one is more competent to write intelligently on this subject than Mr. Baxter, and he has rendered a service, not only to every one who proposes to visit the parks of Boston, but to all who take any interest in the question of providing pleasure-grounds adequate to the needs of our growing cities. This little monograph sets forth so graphically the different uses and purposes to which the various parks, small and great, are adapted; it describes so clearly the vital connections which unify the whole into a single organic system; it points out so accurately the controlling motives of the designs of the various divisions, both from an artistic and a practical point of view, that it will be useful to readers everywhere, and will be one more influence to help in the creation of a sound public opinion in favor of ample park spaces for our cities. Incidentally and inferentially this little book plainly points out the necessity of securing a master of design when any park or system of parks is to be planned. Any one who reads and appreciates what has been accomplished for Boston by the study of a true artist, will realize what Boston would have lost and what any other city will lose when such work is entrusted to some journeyman. The book is published by the author at 255 Washington Street, Boston, and is sold for twenty-five cents a copy.

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLES:—The Hot Winds of the Prairies.....	131
The Cedar of Algeria. (With figure.).....	131
A Remarkable Group of Pines.....	Mrs. F. H. Robbins.....
FOREIGN CORRESPONDENCE:—Notes on Aquatic Plants.....	W. Watson.....
PLANT NOTES.....	333
CULTURAL DEPARTMENT:—A New Method of Using the Ferrocyanide Potassium Test.....	E. G. Lodenman.....
The Vegetable Garden.....	W. N. Craig.....
Hardy Herbaceous Perennials.....	T. D. Hatfield.....
Euryale ferox.....	G. W. Oliver.....
CORRESPONDENCE:—Grape-growing in North Carolina.....	L. J. Vance.....
Nelumbium speciosum in Egyptian Tombs.....	David F. Day.....
RECENT PUBLICATIONS.....	138
NOTES.....	139
ILLUSTRATION:—A Forest of the Mount Atlas Cedar, in Algeria, Fig. 17.....	135

The Hot Winds of the Prairies.

THE overland wagon-freighters to California, during the late summer and autumn season, regarded the eastern slope of the Rocky Mountains as "The Great American Desert," its frequently parched appearance being so different from the verdure and blossom of spring-time. The desert similarity was almost complete when the hot winds were encountered and the plains were reddened in a day. Since then there have been occasional seasons of simooms on the Great Plains, and for two summers they have blighted the corn-fields of Nebraska, Kansas, Iowa and parts of other western states. Sometimes they occur so early in the summer as to seriously damage the Wheat and Oat crops when the grain is filling, especially if a previous drought period like the recent one has robbed the subsoil of its plant-sustaining moisture.

The Corn on the prairies reaches that most critical stage when the pollen in the opening tassel is growing so rapidly that its perfection needs all the plant juices, so that when it falls on the ear it will grow vigorously down the silken tubes to the young grains on the cob, and set the ear full of kernels. But the thirsty winds blow from the west, drinking the moisture from the upper leaves so quickly that the tassel, not being kept moist and cool, is sun-scalded, and its pollen killed before it is shed. Though every leaf may be fresh and green the next day, the farmer knows, from the white and blasted tassels, that no corn will set, and that the fattening hogs and cattle must be sold. That the blasting is due to lack of moisture is shown by the frequent full yield on those parts of the field which retain a moist soil, or are sheltered by trees from the full force of the drying blasts.

These simooms of the Great Plains are liable to occur every summer on the eastern slope of the Rocky Mountains, between the middle of May and the middle of September, being most frequent during July and August, and are seldom severe except during droughts. During their continuance the atmosphere is like a blast from a hot furnace, the tremor of heat often being visible at a short distance. To avoid heat-stroke, it is often as necessary to

get to the leeward of some shelter, as it is to keep from freezing during a prairie blizzard. The thermometers in the shade indicate temperatures from 100 to 110 degrees, Fahrenheit, or even higher, and by midday nearly all unsheltered objects will be uncomfortably hot to the touch. It is necessary to tightly close all doors and windows to keep out the penetrating hot winds, which fortunately slacken at night, allowing the air to cool.

The recorded data relating to these hot winds of the prairies show that one of their most striking features is the abnormally heated currents which are frequently observed, the air between being much cooler, though the atmosphere is heated generally and there is an excess of temperature throughout the affected region. These blasts are of short duration, but often come in rapid succession. The spaces between the narrow currents may be measured by yards, but the blasts occur in groups which may be miles apart, or may cover whole counties and states, as they did last summer, to the sudden and irreparable damage of the previously promising Corn crop.

A popular theory regarding the cause of the hot winds of the Great Plains is that the prevailing westerly summer winds, already dried in the arid mountain regions, are intensely heated by the drought-burned and closely pastured prairie, which reflects or radiates the sun's heat, and for a few miles beyond the local cause, until the heated air rises, the withering blasts are felt in narrow strips. Those who have experienced the hot winds know that they are much more severe to the leeward of miles of bare prairie or of large stubble fields than they are on the lee side of extensive corn-fields or tree-growth. The same difference is noticed during the heated term in cities, between the hot blasts from the metal roofs and paved streets, as compared with the cool breeze from the parks. Thus, the prairie hot winds are inconstant in velocity, varying from breezes to gales, the strong wind of one neighborhood being a light breeze a hundred miles away. The general atmospheric conditions, however, act in coöperation with any local causation.

Scientific men, noticing that the development of dry hot winds over the eastern slope of the Rocky Mountains apparently depends upon the presence of very slow moving low-pressure areas along this eastern slope, and thence eastward, accompanied by a relatively high pressure over the Pacific Ocean off the coast of Oregon, believe that the air in the hot winds comes from over that part of the Pacific Ocean, and is heated in its sudden descent from the summit of the Rockies to reach the prairies below. The westerly winds from the Pacific lose their moisture in climbing the continental divide, and in the rapid fall of many thousand feet to the Great Plains the dry air gains about one degree of heat for each one hundred feet through which it descends, to become the intensely hot winds of the prairies, heating the surrounding atmosphere and falling at any time of day or night upon the soil which is usually also dry, but which may be wet. Dr. Hann has shown that the rising air will leave eight-tenths of its moisture below an altitude of fifteen thousand feet, and, with Professor Bezold and others, has deduced the rate of heating in the descent. The wind, heated by falling, undoubtedly rushes over those prairie areas which are abnormally heated from local causes. It is interesting to note that the hot winds of California are also falling winds, coming from the northward, down the slopes of the Sierras.

The hot winds always wilt the prairie plants, and the intenser blasts scald and shrivel the tender leaves to a crisp in a few minutes when the soil is dry, and always in a few hours, even when the soil is very moist. The lower leaves of Corn and other hardy plants are not usually damaged. Apples are said to have been baked upon the trees, and the leaves so dried as to crumble at the slightest touch. Wheat and other small grain may be blasted from the blossoming time until the grain reaches the doughy stage, and even then it may be shrunken, though it cannot be completely destroyed. The grasses of pastures are burned brown to

sun-cured hay. The most critical period for Corn is after the tassels and silks appear, but before the grain is set. Animals and human beings suffer from the fever heat, the parched skin refusing to perspire. The bark of trees is so burned that they do not easily resist the attacks of insects or the drying winds of the following winter.

Severe damage from the hot winds of the Great Plains is not usually widespread, parts of each farm and sometimes whole neighborhoods being uninjured. Sheltered fields yield fair crops, and some of the corn-stalks bear good ears, while the rest are useful for fodder. The winds generally blow but a few hours, and never longer than three days at a time, though three such periods have followed each other in a single fortnight. If science is correct in its belief that the hot winds are a feature of the climate of the eastern slope of the Rockies, they cannot be expected to disappear or even to become less frequent. They were noticed by the earliest travelers, and they have prevailed in ten summers during the last twenty-five years, causing widespread damage to the crops of five seasons, besides the harm they have already done this summer. They are apparently not becoming more frequent, and there is not any reasonable ground for believing that they will increase in the future.

The blasting effects of hot winds may be somewhat overcome by sheltering the fields with wind-breaks of trees, but the experience of farmers and of those who have planted timber-claims has abundantly demonstrated the costliness and uncertain success of tree-planting in dry climates, especially where irrigation is not available. These very hot winds render the planted groves of the prairies short-lived. Thus, the drought of 1893 destroyed nearly one-tenth of the area of artificial forest in Kansas and seriously injured much of that now standing. A quarter of a century of persistent effort has shown that the Great Plains cannot be kept covered with trees unless the latter be either cultivated or irrigated every year.

The arid region of North America reaches from the California Sierras to the eastern foot-hills of the Rocky Mountains. Its scanty rainfall does not admit of profitable farming except in the narrow fertile valleys which may be irrigated from the never-failing, snow-fed mountain streams. That there are recurring cycles of drier years when these desert conditions sweep eastward as far as the meridian of 100 degrees west longitude, has been the bitter experience of the settlers of the semi-arid portions of the Great Plains. In those famine years the prairie streams run dry, and the few long mountain rivers are thinned to rivulets. Irrigation is then practically impossible. Farm crops and tame pastures fail. The rain-maker becomes once more the medicine man of the Dakotas. The range of wild grasses is so closely grazed on both slopes of the Rocky Mountains that the desert features of central Asia and northern Africa are closely simulated. It is well to remember that such close grazing is believed to have rendered unprofitable even the irrigation which was formerly practiced in the river valleys of those foreign lands. The inhabitant of the semi-arid or "rain-belt" portion of the Great Plains has already prepared himself for a desert life, and is thankful when an occasional rainy year blesses him with an abundant harvest.

The effects of drought may be overcome by irrigation, but this is always costly, and there is not water enough in the prairie streams for all the cultivated land, especially during the droughts, when it is most needed. Hot winds may be resisted by keeping the ground mellow and moist by constant cultivation. By planting varieties which blossom at different times some may escape. But there are seasons when no precautions will avail, and it seems necessary for the prairie farmer, in the years of good crops which are certain to come to this granary of America, to store against the years of failure. Thus, the recent rains throughout the west give promise of good hay and Corn crops. A part of each farm should always be growing drought-resisting crops. The agricultural experiment stations should continue their experiments with the adaptation of varieties

and species of useful plants to dry climates, and coöperate with the national weather bureau in the attempted solution of the problems of the occasional hot winds and scanty rainfall of the Great Plains.

The Cedar of Algeria.

OF the true Cedars of the genus *Cedrus* there are two or three species. The type of the genus, the Cedar of Lebanon, grows on the mountains of Asia Minor. A second species, the Deodar, is Himalayan; and the third, *Cedrus Atlantica*, which is, perhaps, only a geographical variety of the Cedar of Lebanon, is common on the Atlas and other mountain ranges of northern Africa, upon which it often forms great forests. This last tree has proved to be rather more hardy in the eastern United States than the other Cedars, and a blue-leaved form of it is beginning to attract a good deal of attention among the lovers of coniferous plants, who believe that it will prove hardy in the northern states. The climate, however, of the region where this tree grows naturally is so different from that of our Atlantic seaboard that it is not probable that any one will ever see a large or old Cedar-tree in the United States north of Pennsylvania—a fact, if our prophecy proves true, which is much to be regretted, for the African Cedar is, in its prime, one of the most beautiful of conifers, as it is one of the most picturesque in old age. Some idea of this picturesqueness is shown in the illustration on page 335 of this issue, which represents an Algerian Cedar forest with old trees in the foreground.

In Algeria the Cedar occurs at altitudes of from four to six thousand feet above the level of the sea in the Aurès Mountains; in the Belezma, near Batna; at Ben Thaleb, in Babor and Ta Babort, in which locality it is associated with another conifer peculiar to Algeria, the Atlantic Pinsapo, *Abies Pinsapo*, var. *Baborensis*. In the Department of Algiers it is found in the Djurdjura range; on the hills above Blida; in the Ouaransenis, and at Teniet-el-Ahd. The forests of Teniet-el-Ahd, being easily accessible, were badly injured by the French army in the early years of the French occupation, but now the Algerian Government, recognizing the value of these forests, protects them carefully, and is doing everything in its power to restore them to their original condition. This forest has an area of 2,325 acres, and contains some enormous trees of incomparable beauty and incalculable artistic value. The forest is a favorite resort of travelers, who visit it in great numbers, and, quite apart from the timber it contains, its preservation is believed to be a good investment. In a paper on *Les Forêts de Cèdre*, recently published by order of the Governor-General of Algeria, it is said that cedar wood is less enduring and elastic than pine from the north of Europe. The heart-wood is generally employed for railway-ties, and the outer portions of the trunk in construction. Railways of Algerian cedar have been found to last from eight to ten years, and the wood has been successfully employed in paving streets and for shingles. It is, however, in cabinet-making and decorative work that cedar wood is most valuable, large quantities being now employed for this purpose in Algeria and France.

A Remarkable Group of Pines.

IT is seldom that the mutilation of trees adds to their impressiveness, but a cemetery in St. Stephen, New Brunswick, contains some hundreds of White Pines of unusual size and singular beauty which show the curious spectacle of branching, some three feet from the ground, into numerous great limbs sometimes as much as seven feet in circumference. A hundred or so of these trees have attained large size, the most massive of them being seventy-five feet high and eleven feet and more in circumference; and the aspect of the huge horizontal or perpendicular branches laden with heavy foliage, and the rugged knotty boles from which they spring, is striking in charac-

ter, while they have a certain dignity and solemnity especially befitting a cemetery.

As the ground on which they stand is supposed to have been burned over in 1851, when the adjacent country was laid waste by fire, the trees are all of second growth. Such of them as have been cut show from eighty-nine to ninety-one concentric rings, so that their age is less than one hundred years, and they are still full of health and vigor, and promise to endure for years to come. Around them have sprung up hundreds of other stately trees often six or seven feet in girth three feet from the ground, and the forest cemetery has an unusual charm from the solemnizing effect of these noble Pines, through which the wind ever murmurs a gentle requiem for the departed. Impressive as is the spectacle of the lofty unbranched trunks which now and then indicate the site of a primeval forest in Maine or New Brunswick, there is something in the character of these distorted giants more imposing still, so that every visitor to this woodland burial place wanders through its shades over the soft brown needles which carpet its undulating surface with a sentiment akin to awe. The checking of the upward growth in their youth has caused some of the trees to send up as many as fourteen branches, each one of the size and proportions of a leader, and some of them five or six feet in girth. One of the trees shows a sort of Siamese-twin connecting link between two mighty trunks which rise almost perpendicularly to a considerable height.

The keeper estimates that there are a thousand good-sized Pines in the enclosure, several hundred of which are between five and ten feet in circumference. Of the curious branching trees of great size there are over a hundred, the largest of which is eleven feet eight inches in girth, with fourteen limbs forty to sixty feet long, some of them seven feet in circumference. Its height is seventy feet. Another, which is seventy-five feet high, has a girth of ten feet. Adjacent Pines, less remarkable in growth, measure from seven and a half to nine and a half feet round.

Fine, well-kept gravel roads wind among these giants, and from certain open spaces of rising ground there are noble views of the St. Croix River, with chains of wooded hills marking its course. From the river the ground on the British side rises in a series of ridges, on one of which the cemetery is situated, at some distance from the busy little town of St. Stephen, which connects by a bridge with Calais, Maine. The whole river is remarkable for its fine landscape effects, enhanced by the rich coloring of its red granite shores and beaches. Its great tides, coming from the Bay of Fundy, rise at St. Stephen to the height of twenty-five feet and recede, leaving but a thread of a stream to indicate its course, though it is a quarter of a mile in width at its head-waters, broadening at its mouth into Passamaquoddy Bay, with six hundred islands breaking its imposing surface.

No one who turns his summer way to that neighborhood should fail to take a look at the remarkable Pines of the St. Stephen cemetery.

Hingham, Mass.

Mary C. Robbins.

Foreign Correspondence.

Notes on Aquatic Plants.

MARLIAC'S HARDY NYMPHEAS.—I have seen English-grown flowers of some of the choicest of Monsieur Marliac's new Water-lilies, which are exceedingly beautiful. They are at present too expensive for any except enthusiasts with ample means, and it is probably from their not coming true from seeds and their slowness to develop supplementary tubers, that they will be rare for some years yet. But they are quite worth all that their raiser asks for them, and no one, however extravagant in praise he may have been, has said more for them than they deserve. They are quite hardy in the south of England, and they improve both in the size and the color of the flowers as they get older. In Mr. Robinson's garden at Gravetye, Sussex, where they have been established several years, the flowers are from

six to nine inches in diameter and their colors are glorious. The best of those I have seen from a garden at Hartlemere is *Nymphaea Robinsoni*, a large flower of a rich crimson color flushed with orange. Next to this I should place *N. Marliacea ignea* and *flammea*, the flowers of which are of a rich rosy crimson color. *N. Laydekeri fulgens* and *purea* are almost blood-crimson; *N. Laydekeri lilacea* is rosy purple with a lilac shade. An exquisite variety of *N. odorata*, named *Caroliniana*, has numerous long narrow petals of a soft blush-white color, tinged with pink at the base and deliciously fragrant. With the exception of the last named the whole of these *Nymphaeas* are not uniformly colored, the outer segments being thickly peppered, as it were, with the red color on a whitish ground. As the flowers fade they approximate to each other in color, a character which appears to indicate a common origin, or at any rate very close relationship. The production of these beautiful *Nymphaeas* has occupied much time and careful manipulation on the part of Monsieur Marliac. I have tried often to hybridize *Nymphaeas*, but have only once met with any success. Monsieur Marliac claims to have crossed *N. Lotus* with the northern species represented by *N. alba*, but the progeny does not appear to have been sent out yet. It still remains for some one to cross *N. Lotus* with the *stellata*, or the latter with the *alba* section. Our most beautiful *Nymphaeas* open their flowers at night and close them before noon, which is a drawback in gardens where the public are admitted only in the afternoon.

NELUMBINUM SPECIOSUM.—We have flowered three distinct varieties of the Sacred Lotus this year, namely, the double white variety, which is somewhat shy, having produced only two flowers, although the plant is in vigorous health. The tinge of pale green at the base of the petals in this variety adds a charm to its chasteness. The second one is a rose-colored variety with enormous leaves on stalks six feet long, and the third is a giant in leaf and flower, the latter being rich rose-red, almost crimson. There are other varieties yet to flower at Kew, a collection of the best and most distinct of the Japanese varieties having been obtained last year from a reliable nurseryman in that country. I find that this plant does better when planted in a bed of soil in the large Water-lily tank where the water is about six inches above the top of the soil than it does when planted in a mud-bed in a corner, or in a pot or tub in which water is always standing. There is no nobler picture in our plant houses now than a big group of this plant in the middle of the Water-lily tank, with all kinds of *Nymphaeas* growing in the water about it. There are less worthy objects worshiped in these times than the Lotus.

VICTORIA REGIA.—Considerable variation in the size and red tinting of the flowers is observable in this plant. This year the Kew specimen is unusually good, the flowers being half as large again as those of the plant grown last year, and the red tints displayed on the second day, when the petals reflex, are clearer and brighter than on most flowers that I have seen. Here the Victoria is treated as an annual, the seeds being sown in February, the first flower usually expanding in the third week in July. The temperature of the water in the large tank is kept at about seventy-five degrees; the house is always well ventilated and the water is kept constantly moving by a running tap at one end and an overflow at the other end of the tank. This year the soil in which the plant is growing is the same as that used last year, a new departure which has been followed by excellent results, the leaves being larger, with a deeper rim than I have seen at Kew for years, and there is a total absence of spot, which in previous years has disfigured the leaves, and which, according to Mr. Massee, was caused by a fungus found in fresh cow-manure.

LIMNOCHARIS PLUMIERI is a handsome plant for aquaria, as it grows quickly, ripens seeds abundantly and will thrive in any corner where there is a little mud. At Kew it is planted in the bed containing a big mass of *Papyrus Antiquorum*, mixed with *Caladium Chantini*, and the effect produced by the long-stalked bright green leaves of the

Limnocharis, the red leaves of the *Caladium* and the elegant paper reed is rich and lasting. *Caladiums* are excellent plants for tropical aquaria. The *Limnocharis* flowers freely, producing scapes about eighteen inches high bearing umbels of white flowers; its leaves are, however, its most decorative feature. *L. Humboldtii* is quite different in habit, its leaves being floating, and its flowers, which are produced singly on stalks a few inches high, are elegant yellow cups three inches across. Botanists now call the last-named plant *Hydrocleis Commersoni*, restricting the genus *Limnocharis* to one species, the name of which has been altered to *L. emarginata*. Both this and the *Hydrocleis* are natives of South America, and belong to the order *Butomaceæ*.

CABOMBA AQUATICA or *CAROLINIANA* is now an established favorite with growers of aquatic plants in this country, plants of it having been introduced to Kew from British Guiana a few years ago. I suppose it is common in some parts of the United States. Grown in a glass tank or large bell glass it is an interesting object, the finely cut submerged leaves and peltate floating ones, with the yellow Ranunculus-like flowers, making a pleasing picture. At Kew it is grown in the tank containing the *Victoria regia*, where it makes a large tangled mass of stems and leaves. The Australian representative of this—namely, *Hydropeltis* or *Brasenia peltata*—is rarely met with in English gardens now.

CRYPTOCORYNE CORDATA.—This plant is now represented at Kew, where it is grown submerged in a warm-water tank. It has ovate leaves four inches long, colored dark green and mottled with dark brown. The genus is a remarkable member of the order *Aroideæ*, and contains about twenty-five species, all tropical Asiatic and all aquatic, with simple leaves and tubular green or brown spathes. The spathe of *Cryptocoryne cordata* is a foot long and colored purplish green.

THALIA DEALBATA is one of the most striking of the plants grown in the tropical aquarium at Kew, where it grows to a height of about six feet and produces numerous flower-spikes all through the summer. This year it has been established in the lake along with Marliac's yellow Water-lily and *Richardia Africana*, and it has grown surprisingly well. If not grown as a garden-plant in the United States (it is wild in South Carolina), it is worth attention. The leaves are handsome, the ovate blades being covered with a flour-like bloom, and the leaf-stalks are of peculiar structure. The long curving spikes are very elegant, bearing at first clusters of deep blue flowers, and afterward plenty of seeds. The plant is easily multiplied by division. The roots must be submerged in water during the growing season. In winter the plant dies down to the soil.

W. Watson.

London.

Plant Notes.

LESPEDEZA BICOLOR.—Flowers of this shrub are now past their prime, but its variety *Intermedia* is showing its best bloom. These are two pretty medium-sized and graceful shrubs with long arching branches, trifoliate leaves on slender petioles, neat foliage and drooping or half-erect racemes of rose-colored or purple flowers. The flowers are not as large or as handsome as those of the herbaceous *Lespedeza Sieboldii*, but if the stems are cut back hard in early spring the individual flowers will be larger and will be borne in denser clusters. *L. bicolor* certainly deserves a more extended use than it has yet received. *L. Sieboldii*, which has a shrubby appearance, although its stems die to the ground every year, flowers later, and in time becomes a very large and graceful plant. A figure of both these species, with an account of their various synonyms, will be found in *GARDEN AND FOREST*, vol. v., p. 112.

HYDRANGEA QUERCIFOLIA.—This plant, which has a panicle inflorescence somewhat like that of the Japanese *Hydrangea paniculata*, is still in good flower, and is really one of the finest of all the *Hydrangeas*. It sometimes approaches the habit of a tree and grows fifteen or more feet

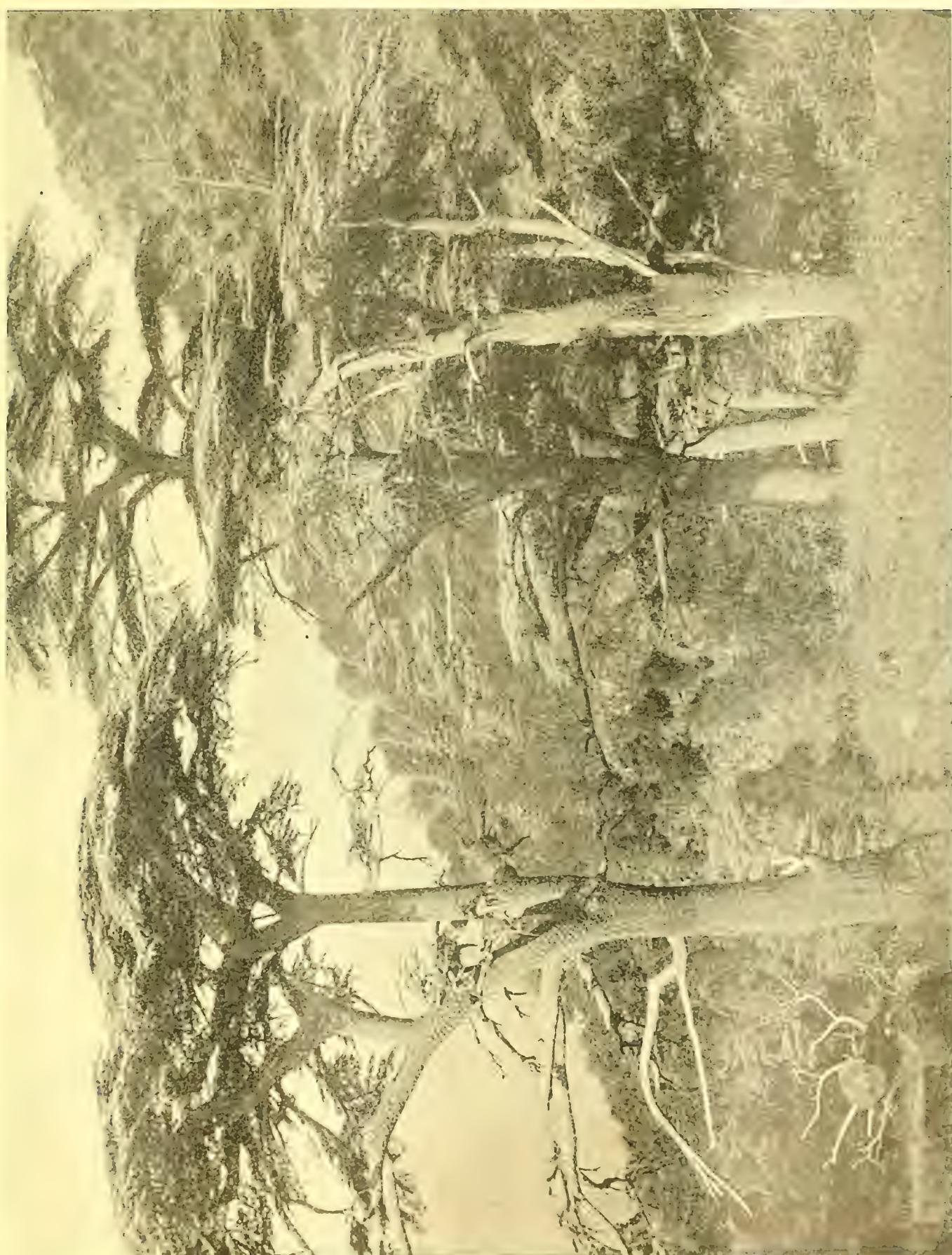
high in Georgia and northern Florida, where it is found wild, but it is scarcely hardy in northern New England, and is rarely more than four or five feet high, even in a sheltered situation. It becomes a spreading and graceful shrub, however, and will flower every year, and its large handsome leaves turn to a rich wine color in autumn. *H. radiata*, which is a native of the Carolina mountain country, is a smaller plant and quite hardy in this latitude, and it bears abundantly its fastigiate cymes, in which the sterile marginal flowers are very large and pure white. The beauty of this plant, however, is its foliage, which is dark green above and covered with a silvery white down on the under surface.

PARDANTHUS SINENSIS.—Among summer-flowering plants of the Iris family few are more valuable than this modest Chinese species when rightly understood. It grows to a height of four feet, with glaucous, ensiform, equitant leaves. The flowers are produced in a loose panicle and are about two inches across, and comparatively small for the size of the plant. The color is bright yellow, with dark purple spots. When in full flower in a half-shady position the plant is really ornamental. It will naturalize quite easily and is appropriate in woodland scenery. This plant appears to retain its flowers longer in this country and develops into a far more beautiful object here than it does in Europe, owing, perhaps, to a warmer and more suitable climate. The root is tuberous and the plant may easily be increased by division or by seeds, which are produced in great profusion. A sandy and porous, but fertile soil is most suitable, and a half-shady position in a glade or copse seems to be its ideal home.

PHYLLAGATHIS ROTUNDIFOLIA.—This is a plant of the Melastoma family with large elliptical, or almost orbicular, leaves. The veins are strongly marked on the upper surface, which is of a deep olive-green color and very glossy. The lower side is dark red, with stout ribs. The plant is of a compact habit with opposite leaves, somewhat similar to those of a *Sphaerogyne* in appearance. The rather small pinkish flowers are produced in axillary heads, but are insignificant. As a bold foliage plant this species is very effective, and it will probably be found quite amenable to open-air culture if tried, and if so it will prove an acquisition to subtropical gardening. The propagation is as easy as it is interesting. Old well-ripened leaves when laid on the surface of sand in shallow boxes, as is done with the leaves of *Begonia Rex*, will form thousands of little plants in a very short time. The principal veins should be cut about an inch apart, but the leaf should otherwise be left entirely whole. A temperature of about eighty degrees and careful watering is essential until the plantlets begin to appear. A rich fibrous vegetable soil and plenty of water is needed by the young plants, but the excessive heat and atmospheric moisture required by *Sphaerogynæ* and *Cyanophyllums* are not needed for the full development of this interesting species.

TRADESCANTIA REGINÆ.—This is a robust and erect-growing plant with very effective foliage. The leaves are nearly sessile, ovate-acuminate, almost cordate at the base. Their surface is of a very dark violet-crimson, almost black, in the centre, bordered with silvery white and edged with green. The lower side is a uniform reddish violet. When well pinched and grown in rich fibrous soil the plant will form bushy and very ornamental specimens, and as it grows with the greatest ease it will prove useful for house culture and home decoration. Cuttings root easily even without bottom-heat.

PANDANUS BAPTISTII.—Unlike most Screw Pines, this species is entirely unarmed. The leaves are of a less solid texture than those of most other species—very long, arching, almost linear, an inch to an inch and a half wide by several feet in length. The color is a glaucous-green, with narrow pale yellow stripes. It thrives best in comparatively small pots, exposed to the full blaze of the sun and watered moderately only. If grown in a shady and moist position it is apt to become very weak and tender. The



propagation in the usual way by means of cuttings of young side shoots is quicker than in the case of most other species of Pandanus. A strong fibrous loam and firm potting is to be recommended. As a plant for table decoration and similar purposes it is unsurpassed.

Cultural Department.

A New Method of Using the Ferrocyanide Potassium Test.

DURING the work of preparing the Bordeaux mixture, both at Cornell and in various parts of New York state, special attention has this season been directed toward the behavior of the ferrocyanide of potassium test. The method of using the test, as commonly described, is as follows: Add the milk of lime to the solution of copper sulphate until no discoloration appears, when a few drops of a solution of the ferrocyanide of potassium are added to the mixture; as long as an insufficient amount of lime is present a dark reddish brown precipitate is formed, but this is no longer produced when enough lime has been added.

The above directions, which I believe are correctly, though briefly, stated, are apparently very simple and easily followed, yet they have undoubtedly been misunderstood by many, and for this reason much of the mixture prepared in accordance with them has not been properly made. The point which it is necessary to decide is this: Does the test clearly show the red color as long as more lime is needed, or in the discoloration present, yet obscured by the surrounding mass so that it cannot be distinguished? In case it is present, but practically invisible, we at once have an explanation of some of the injuries which have followed the use of this fungicide.

All who have had experience in preparing the Bordeaux mixture must have noticed the different shades of color which appear as the proportion of lime in the mixture is increased. After the copper sulphate solution has become turbid a distinct greenish color may be seen; but as more lime is added this tint is replaced by a deep and intense blue. Upon the addition of more lime this color becomes more pale, although the blue is still plainly visible, and the greater the amount of lime the lighter will be the shade. If the test solution is added to the mixture while the green tint is present a clearly marked discolouration will take place. If, however, the solution is added to the mixture while it has the deep blue appearance, it requires sharp eyes to discover any change in color other than the faint yellow of the solution added; and the same is also true when the mixture is tested after considerable quantities of lime have been used.

But let the operation of the mixture be reversed. Instead of adding the solution of ferrocyanide to the mixture, let some of the mixture be added to the solution, and then carefully watch the changes. Chemically the reactions are probably the same, but practically there is considerable difference in the apparent result. Before much lime has been added to the sulphate solution a marked discolouration takes place when the test solution is added to it; but upon the addition of more lime the brown color becomes less distinct, and when the mixture has assumed the deep blue color, practically no further discolouration can be discerned. But if at this time a drop or two of the test solution be placed upon a smooth white surface, as in a saucer for example, and then an equal amount of the mixture be added, it will be found that an abundant red precipitate is formed, for it can plainly be distinguished against the clean white of the porcelain. But when the solution is dropped into the mixture no change seems to take place, for, although the precipitation occurs, the brown particles are so intermingled with the mixture that they become lost to view. By the use of the new method the precipitate is retained where it may be seen with ease. When the mixture is tested in this manner it will be found that lime must be added until the dark blue color is changed to a considerably lighter shade before the ferrocyanide fails to produce a discolouration. The time to allow for the reactions to take place in the saucer need not exceed a minute, and if after that time no red sediment is seen it is safe to say that the mixture is ready for use. A considerably larger quantity of lime than was formerly supposed is necessary, and it is believed that some of the unsatisfactory results from using the Bordeaux mixture may in this manner be explained. It is to be hoped, at least, that such is the case, for when much spraying is to be done the use of some accurate method of determining the amount of lime to use is a great convenience, especially when the preparation of the mixture is entrusted to unskilled hands.

E. G. Lode man.

The Vegetable Garden.

Celery.—All late plantings should now be completed. I have often seen growers setting out plants early in September, but, while Celery makes rapid growth during that month and part of October, it has not sufficient time to form good heads, at least in this section. From an early lot of Golden Self-blanching and White Plume we have been using well-blanching heads since July 20th. Except for the very late crops, we use boards instead of the usual earthing-up process, and this method is superior in every respect. The Celery does not rot at the heart; it can be watered while being blanched; it is ready for use quite as early as when earthed up; it lifts much cleaner and more easily, and is of equally fine flavor. Complaints are made of early sorts rusting badly, especially of the Golden Self-blanching. We make a point not to allow our plants to become dry at the root at any time, and have never been troubled with rust. If the plants can be kept moist at the root and steadily growing, rust will be rarely seen. We take advantage of copious rainfalls to go over our trenches and soak them with sheep or cow manure, watering while the ground is moist. Liquid stimulants should not be given while the ground is dry, unless a watering with clean water has been first given. Plants being blanched should be looked over weekly, and any signs of rot on the stems removed. The ground about the plants must be kept well stirred; a little special Celery fertilizer can advantageously be worked in among them.

Onions.—The main crop of onions is usually ripened enough to pull up here about August 25th. Some varieties, such as Giant Rocca, are about a month longer in maturing. There can be no doubt that where fine bulbs are desired, sowing the seeds in flats and transplanting in the open ground at the end of April or beginning of May gives far the best results. Onions treated thus are fully half as large again, on an average, as those sown in the open and thinned, and they mature from two to three weeks earlier. Giant Rocca gives some bulbs eighteen inches in circumference; Danvers Yellow and Wethersfield, occasional ones twelve inches, and Cranston's Excelsior, a very superior English kind and an excellent keeper, thirteen to fourteen inches. As a rule, those raised from seed sown outdoors do not exceed from eight to eleven inches, but for many purposes they are preferable to the larger ones. To have large onions the ground requires to be heavily manured, to be kept well soaked with water all the growing season, constantly cultivated and clear of weeds. Stimulants should be given every ten days from the beginning of July until the middle of August. Our finest onions are produced on heavy clayey ground; those on light soil mature earlier, but with the same treatment fail to give as fine bulbs as the heavier land.

Tomatoes have now almost covered the six-feet trellises we grow them on. We look over these once a week to remove laterals, cut off decaying foliage and tie up the shoots. Trellises need well supporting from now onward, as they are very heavily laden with fruit; a strong gust of wind is apt to play havoc if this is not attended to. Out of eighteen varieties we are growing in the open this year the following are the most satisfactory: May's Favorite, Ham Green Favorite, Eclipse, Paragon, President Cleveland, Comrade and Acme. Ladybird, a new English variety, has a very fine flavor, but the fruit is too irregular. Our earliest batch for winter fruiting are now ready for a shift into six-inch pots; these we grow outdoors until the middle of September to secure stout, stocky plants. A successional sowing made at once will give ripe fruit in January.

Cucumbers of the English frame varieties require frequent syrings and copious supplies of liquid stimulants. Decaying foliage and weak shoots should be removed every few days, and the shoots pinched at the second or third leaf beyond the fruit. Unless a Cucumber-house is at command, it is difficult to have a regular winter supply. We generally plant a few at the warm end of a Rose-house at the end of August, and these give us a supply until Christmas; a temperature ten degrees higher is needed, however, to do them justice. Varieties fruiting outdoors need looking over occasionally, and any fruit ripening must be cut off.

Peas and Beans.—The main Pea crop is now past; the brush used for these, if new the present year, will serve another season. The best of the newer Peas we have tested this season are Juno, Evolution, Cox's Improved Stratagem, Heroine and The Queen; the first named, being the most satisfactory, we think is destined to become a standard variety. The pods are generally produced in pairs, are thick and broad-backed,

and average from seven to ten large deep green peas in each, of excellent flavor. As it grows only from two to two and a half feet in height, it is specially useful for small gardens where space is limited. As the season progresses, and we get heavier dews, late sowings will begin to mildew badly. Copious waterings are needed by late batches, or they will produce but little. Our latest sowing of String Beans are now some four inches high; these will give us pickings until frost. We usually get some heavy winds toward the end of August, and it is well to look over Pole Beans, and where the poles are shaky firm them.

Miscellaneous.—Lettuce, to be nice and crisp, requires to be kept moist at the root, and from now onward fewer heads will be produced. A sowing is now seasonable. The plants can be stored in cold frames before severe weather. We make a further sowing early in September and transplant into frames in October. Radishes can be sown until the beginning of September. Asparagus beds require hand-weeding or hoeing, and if any of the troublesome beetles are still on the plants apply Paris green with a force-pump at the rate of one pound to fifty gallons of water. Late Beets should be thinned out by this time and kept well cultivated. Cabbage, Brussels Sprouts, Savoys and Curled Borecole will be benefited by having a little chemical fertilizer hoed among them. Nitrate of soda we find excellent. Cauliflowers can scarcely have too much moisture at the roots, unless the soil is of a very clayey nature, and liquid stimulants once a week will prove helpful. Leeks, like Celery, are gross feeders, and a soaking of strong liquid-manure after a rainfall will speedily show good results; a little earth can be drawn up to the plants as they grow. Sweet Corn for late crops requires to have the ground frequently stirred. Early Munich and other quick-growing Turnips may still be sown. We sow our prickly Spinach the last of August, using land vacated by Onions for the purpose. Endives, when well grown, need tying up to blanch, and an occasional watering with liquid-manure. Muskmelons, if lifted from the ground and placed on a block of wood or back of a plant-saucer, will ripen better and be less liable to rot in wet weather; if the plants are too large to admit the use of the hoe remove weeds by hand. The earlier varieties of Potatoes we are now lifting and storing in a cool cellar; in September the remainder are stored, and a crop of Rye sown on the ground to be dug in next spring. Ground occupied by Parsnips, Carrots and Beets needs stirring with the hoe, care being taken not to break the foliage or cut the roots. Crops, as they become spent, should be consigned to the rubbish pile in order that the garden may have a presentable appearance. Early in September is a good time to gather together materials for an early Mushroom bed; an open shed is the best place to lay the manure. Last winter we had so much better results from spawn made by a New England firm of seedsmen over imported spawn that we purpose to rely on it exclusively for our next season's crop.

Taunton, Mass.

W. N. Craig.

Hardy Herbaceous Perennials.

In the open ground which once was an old vegetable garden at Mr. Kidder's place, on Milton Hill, Massachusetts, away from the roots of trees, and consequent shade, perennials are seen growing in their most suitable conditions. They may thrive for a while in new shrubberies, but when these are filled with roots, and with an impoverished soil and lack of moisture, perennials soon die out. My plea has always been to give the herbaceous garden a position by itself and for its own sake, and not a subordinate place, as we generally find. Plenty of room should be allowed for the full development of individual specimens, and with a good selection, appropriately placed, with a view to height, time of flowering and color-effect, the garden may be made attractive the whole year round. The herbaceous ground in the Harvard Botanic Garden gives one a good idea of what may be done with herbaceous plants when grown in large quantities together. With grass verges between the beds, the picture of so many plants of varied colors is really a beautiful one, for here and there are masses large enough of some kinds to make quite a brilliant effect. They are arranged in beds in an open space, but, being in botanical order, they lose much of the effect they could otherwise be made to have were it possible to select and arrange the colors, heights and dates of flowering. The Harvard garden is a good place to visit when one wishes to make a selection of the best, for here seeds of the rarest and most beautiful come along with those possessing only botanical interest, from all parts of the temperate zones of both hemispheres. Mr. Henry Hunnewell, in planning his new place at Wellesley, with a full appreciation of the value of herbaceous plants in the landscape,

has alternated irregular beds of small flowering shrubs and herbaceous plants. Referring to a magnificent specimen of the late-blooming *Hemerocallis Thunbergii* in this connection, he suggested that the colors of the Japan Iris, mostly blue and white, would blend well with the sulphur-yellow of this Day Lily, and both bloom at the same time. In a recent number of GARDEN AND FOREST there is a description of a new Day Lily exhibited by Messrs. Wallace, of Colchester, England, which was found growing among Japanese Iris in a wild state.

In wandering through the old garden paths at Mr. Kidder's, with wide borders of herbaceous plants around plots of vegetables, it seemed to me just the spot where a lover of hardy plants could spend a pleasant afternoon. These plants may not be arranged most effectively for a landscape picture, but none of them look homesick, and they suggest how many a modest garden could be made beautiful by liberally planting the borders along the paths.

Although the plants have been described more than once in GARDEN AND FOREST, I venture to note a few of the more striking ones. Here were large masses of *Clematis Davidiana* and *C. tubulosa*; both species belong to the sub-shrubby section and are allied to the Atragenes. They have handsome, trifoliate, deep green leaves of classic cut, their stems being sparsely clothed with blue tubular flowers, which continue to bloom until late in the season. *C. Davidiana* is sweetly perfumed. *C. Pierotti* and *C. paniculata* occupied posts, doing duty at two opposite corners; both are beautiful climbing species, handsome in foliage as well as bloom. *C. Pierotti* comes in a week or so before *C. paniculata*. There was a grand clump of *Veronica longifolia*, var. *subsessilis*. It is a giant among Speedwells. The color of the flowers is the deepest blue, and it is the latest of all to flower. *Cimicifuga racemosa* is a bold and handsome plant here, with long-branched spikes of white flowers. It is a member of the Crowfoot family, with handsome triternate leaves which endure until the autumn, so that the plants are never unsightly. *Lythrum roseum*, var. *superbum*, is one of the showiest of the Loosestrifes. *Lysimachia clethroides*, a very distinct and handsome member of the Moneywort family, is an acquisition when one has a proper place for it, but generally in the open border it makes itself a nuisance by spreading. *Rudbeckia maxima* is a tall, distinct-looking species, with entire glaucous leaves and large yellow flower-heads, with a long black receptacle. It is a handsome and effective plant for the rear ranks of the border. *Gypsophila paniculata* is most effective, with its large feathery sprays of small white flowers, and so is *G. acutiloba*, a somewhat taller-growing species.

Wellesley, Mass.

T. D. Hatfield.

Euryale ferox.—This aquatic, which is second only to the *Victoria regia* in the size of the leaves, was tried in the basin of the Bartholdi fountain, in this city, for the first time last year; it flourished well and produced a good number of its curiously shaped and colored flowers, ripened several capsules of seed, and then disappeared, root and branch, long before the approach of cold weather. This year its behavior has been even more erratic; some of the seed was saved from last year's plant, kept in water and sown about the middle of January in a tank kept at a temperature of about eighty degrees, Fahrenheit. None of them germinated, however, and we came to the conclusion that we would have no Euryale this season. The large box in which it was planted last season had not been disturbed further than by planting a Zanzibar Lily in it. About the beginning of June the seed of the Euryale which had lain on the surface of the soil all winter began to germinate, and now there are six good-sized plants in the box, and all of them in bloom. It may be added that the soil is only about ten inches beneath the surface of the water; during the winter the ice was thicker than this by at least five inches. A peculiarity of this plant is the way in which the flower-buds make their way right through the leaves and then expand. The foliage is so thick together that the crown of each plant is covered with leaves.

Botanic Garden, Washington, D. C.

G. W. Oliver.

Correspondence.

Grape-growing in North Carolina.

To the Editor of GARDEN AND FOREST:

Sir,—The grape-growing district in the central portion of North Carolina now embraces parts of the counties of Wake, Moore, Cumberland and Richmond. Only within the past five

or six years has this section of North Carolina come into prominence as a fruit-growing country. The value of a given tract was previously measured by the number of turpentine boxes it would cut, and by the amount of timber it would yield to the acre. The land itself really had no value, and after it was cleared, being considered unfit for cultivation, sold for fifty cents an acre; hence that portion of North Carolina known as the Pine-barrens or sand-hills was, and still is, one of the most barren and desolate regions of the state. Scarcely cultivated at all, sparsely inhabited and robbed of the noble Long-leaf Pine-trees, the face of the country presented a scene of waste and ruin. There are extensive areas where the surface is simply a bed of white sand, and yet this is the kind of land that has been made to yield good crops, especially of fruit and grapes.

The mean temperature of this section for December, January and February of last year was 40.8, and this mild temperature, with the absence of untimely frosts, fogs and heavy dews, are all conditions for successful grape-culture. Mildew and black-rot are almost unknown in the North Carolina belt. The soil in the south central portion of the state varies in character. In Moore County sand predominates, but with commercial fertilizers this land can be made exceedingly productive.

About ten or twelve years ago, as the story is told by the natives of Moore County, a Swiss farmer began planting vines near the town of Southern Pines. He had had some experience in grape-growing in the old country. He claimed that the region was especially adapted to the raising of grapes, and to show his faith he set out several acres into vineyard. The vines flourished where the soil seemed poorest, and the fruit was excellent in size, color and flavor. The effect of this grower's success was to stimulate the grape-growing business in his locality, and land quickly rose in value to ten dollars an acre, and some of it now cannot be had for fifty dollars. About Southern Pines alone there are 1,000 acres in vineyards, and as many more in Peaches, Pears, berries, etc. Grapes from this section arrive in northern markets in the latter part of July, about one month before those from the Hudson River district and the lakes of western New York, and large profits have been realized. The prices last season did not go below ten cents a pound. The New York grape-growers, who raise their fruit at a greater cost on land worth one hundred dollars an acre, seldom receive more than three cents a pound.

Many of the vineyards set out lately are owned by northern people, who have been attracted by the profits of the industry. The largest vineyard in Moore County is that of the Niagara Grape and Fruit Company, which consists of 107 acres. At this season of the year, when the vines are ready to be stripped of their hanging clusters of fruit, such a vineyard, with the long, straight rows stretching out for a mile, is a beautiful feature of the landscape. Only two varieties of grapes are grown here to any extent—the Niagars and Delawares, which are the kinds that flourish best and bring the highest prices. About twenty miles from Southern Pines is the Tokay Vineyard, with about a hundred acres in vines. Many varieties are included, as Scuppernong, Meish, Flowers, and also Ives, Delaware, Concord and others. Considerable quantities of wine are made at the Tokay Vineyard, near Raleigh. In Wake County there are five hundred acres of vineyard. The favorite varieties here are Ives and Concord.

Through many of the eastern counties of North Carolina—Davie, Forsyth, Guilford, Alamance, Warren and Vance—the Scuppernong family thrives best. Here are vineyards unlike any others. In the forest the *Vitis rotundifolia* grows wild. When cultivated, the vines are trained on broad flat arbors. An immense Scuppernong vine on an old homestead at Manly has a trunk four or five inches in diameter, while the branches spread over an area of an eighth of an acre. The vine is said to be at least fifty years old.

In preparing to plant a vineyard most of the land needs to be cleared of trees and stumps. This is usually done by contract, the average expense being about eight dollars per acre. It should then be cultivated in Cow Peas, a crop which in the south serves the purpose of Clover in the north. Growers prefer rooted plants to cuttings, especially with such varieties as Delawares, which do not root readily. About 700 vines are set to the acre in rows about six or eight feet apart. The strong-growing varieties, such as Concord and Niagara, are allowed eight or ten feet. The vineyard is kept cultivated during the summer until about the middle of August, when the land is planted in Cow Peas. The first summer after planting little work is necessary, except to keep the ground loose and in good condition. The next thing is to provide the posts and wire. The growers favor a trellis of two wires, the upper

one about five and a half feet above the ground, and the lower one about two feet below the upper wire.

The items of expense in grape-growing, according to statements of many practical growers, are about as follows: Posts and wire, say, \$24.00 an acre; the cost of plowing, planting and tying, \$5.00 an acre; the fertilizers for the first year may amount to \$10.00 an acre; for the second and third years about \$5.00 an acre. Then there is the cost of picking, packing and shipping, which averages twenty-five cents a crate of twenty-four pounds; the freight rate to New York is about fifty-five cents a hundred; the commissions are usually five per cent.

The vines begin bearing the second year, but it is not until the third year that the crop is harvested. The vineyard will then produce about two tons to the acre. The yield increases during the next three or four years, when the vines reach their maturity and full vigor.

New York.

L. J. Vance.

Nelumbium speciosum in Egyptian Tombs.

To the Editor of GARDEN AND FOREST:

Sir,—I have read, with much interest, Miss Vail's article, in GARDEN AND FOREST (August 7th), entitled "The Collection of Funeral Wreaths and Offerings in the Museum of Egyptian Antiquities at Giseh." The article is a valuable one, and presents in a striking way the results of archaeological inquiry in the land of the Pharaohs, so far as relates to the plants employed for funeral purposes. That *Nelumbium speciosum*, so frequently represented in Egyptian sculpture and painting, has disappeared from the Nile, is a proposition made, perhaps, a hundred years ago; but that it once grew in Egypt as a wild or cultivated plant is not to be questioned.

Miss Vail says in her paper that "it is strange that the Sacred Lotus, the classical flower that Herodotus calls the Rose-like Lily of the Nile, *Nelumbium speciosum*, has not been found" in the catacombs.

The purpose of this note is simply to call attention to the fact that in the Abbott Collection of Egyptian Antiquities, now the property of the New York Historical Society, and on exhibition in the rooms of the society in the city of New York, there are specimens of the leaves of *Nelumbium speciosum*, obtained from Egyptian tombs, wonderfully well preserved after the lapse of twenty or thirty centuries.

Buffalo, N. Y.

David F. Day.

Recent Publications.

The Flora of the Assyrian Monuments and its Outcomes.
By E. Bonavia, M.D. Westminster: Archibald Constable & Co.

"From the real Assyrian flora," says the writer of this book, an English army surgeon, "I have attempted to creep up to their sacred flora and to interpret certain symbols found woven in with this"; and, he also tells us, his interest in the subject was first excited by a study of the most frequent emblem found on ancient Assyrian sculptures, the "Sacred Tree," intimately connected with which is another called the "Assyrian horns." As a result he has given us a mass of interesting information which could hardly be acquired from other books without a vast deal of trouble, and some equally interesting theories, in regard to the development of artistic motives and of religious or superstitious beliefs, which seem well founded.

Among the plants which Dr. Bonavia has found clearly presented upon the Assyrian sculptures, the Date Palm, *Phoenix dactylifera*, is entitled to the first place. It is, of course, always depicted in somewhat conventionalized fashions, but, while these vary among themselves, they always present the tree, with its leaves and its fruits and the characteristic surface of its trunk, so that it cannot possibly be mistaken for anything else. Next in importance, perhaps, comes the Vine, *Vitis vinifera*, which is even more realistically portrayed in the shape and veining of its leaves and the form of its grape-bunches, and in the way in which they are set opposite one another on the stem. The Pomegranate, *Punica Granatum*, is likewise intelligently portrayed, although, working in hard stone, the sculptor was obliged greatly to exaggerate, relatively to the size he bestows upon the plant as a whole, the dimensions of its leaves and fruit in order to render them distinctly visible.

The Fig-tree, *Ficus Carica*, is shown with digitate and also with palmate leaves, indicating that more than one variety was known to the Assyrians, while the peculiar shape of its fruit is faithfully preserved. Equally unmistakable is a Pine-tree, assumed to be *Pinus Brutia*, whether it is depicted as a thick-foliaged conical mass or more conventionalized, with separated branches each tipped by a cone. A reed, supposed to be *Arundo Donax*, conspicuously figures, in two versions, in portrayals of river margins. A Lily, doubtless *Lilium candidum*, is very beautifully interpreted, as is also a composite plant which Dr. Bonavia believes to have been, most probably, *Hieracium pannosum*. A very curious and much conventionalized plant, difficult to determine, he thinks may be meant for the Baobab, *Adansonia digitata*, while of another tree, he confesses, "nothing can be made. It may be a Plum-tree, it may be an Apple-tree, or something else. Both these fruit-trees were indigenous in the regions south of the Caucasus and the vicinity of Persia."

All these attributions Dr. Bonavia has made, not by means of mere guesswork, but, where the slightest doubt could exist, through patient study of the monuments in the British Museum and of the records of ancient Assyrian customs and possessions, and after consulting the best botanical authorities in regard to the flora of the regions with which he deals.

He also discusses two other objects the identification of which is less variously supported, as they seem to be fruits disassociated from the plants which bore them. Lying on tables or platters, among the objects offered to monarchs or deities, he thinks he has identified bunches of bananas and slices of melon. Certainly the forked objects reproduced in the illustrations of his book are good interpretations of banana-clusters, even to the scars left at their base by the falling of the bracts; and there seems no reason to believe that this fruit may not have been imported into Mesopotamia by way of the Arabian Gulf, in which case it would have been a rarity well adapted to formal or sacerdotal offerings. Both the watermelon and the muskmelon were doubtless also known to the Assyrians, but Dr. Bonavia thinks that the crescent-shaped objects on the sculptures probably represent the fruit of the latter—"some fine kind of *Cucumis Melo*, such as are still grown in Persia at the present day." With these plants, which, not including the doubtful Baobab, or the tree of which nothing definite can be made, are ten in number, the list of those actually pictured by Assyrian sculptors is complete.

But, in addition to what, in spite of their partial conventionalism, we may call these actual portraits of plants, trees much more abstractly treated, in a distinctly ornamental way are constantly seen on the monuments and on the small cylinders used as seals, sometimes isolated, but on the monuments usually figuring in ceremonials as conspicuous objects of adoration. These are the famous "Sacred Trees," analogies to which exist in the artistic remains of other ancient nations, and a reflection of which is found in the story of the Garden of Eden. Among those of the Assyrians Dr. Bonavia thinks that he has recognized conventionalizations of four or five different trees, some of which are readily identifiable, while others are less so, owing to the minuteness of the work on the little seals. These are the Date-tree, the Vine, the Pomegranate-tree, the Fir-tree, and "not improbably" the Oak. But, again, the Date-tree holds the most important place, and not unnaturally, as, in any country where it grew, it must have been especially revered in those very early times when religious and superstitious customs had their origin, and when "man lived by hunting and fishing and by eating anything he could find growing in the forest," as well as later on, when he had become semi-civilized, but, as yet, led a merely pastoral, not an agricultural, life. We can easily fancy the "first-comers into the plains of Chaldea finding forests of Date-trees, the sweet fruit of which, with the products of their flocks, enabled them to increase and multiply. We can imagine how this tree eventually became

to these people the 'tree of life.'" And in later days they must have cultivated it with diligence, for Herodotus wrote that the plains of Babylon were thickly covered with Date Palms, which were equally precious for the shade, for the fruit and for the wood that they yielded. In still later times the name of "Tadmor in the Wilderness," Palmyra, indicates the local plentifullness of this tree; the shores of the Dead Sea also "are said to bear unmistakable evidence of whole forests having once existed somewhere in its vicinity or on the banks of its tributary rivers"; and "Layard gives a plate representing conquerors cutting down the Date-trees of a conquered country. This terrible way of clearing a conquered land of its food-trees must have been frequently practiced, and will amply account for the almost total disappearance of the Date-tree from whole regions where, at previous times, it must have existed abundantly." Thus, as the "tree of life," as the most beneficent of their possessions, and as the symbol of fertility, the Date Palm won its prominent place in the emblematical cult of the Assyrians, and is pictured as an object of worship under various singular and decorative, but readily recognizable, forms.

Very important also was the Vine to these ancient people, and very frequent and beautiful are the Sacred Trees formed from the elements it supplied, sometimes with waving branches arranged in regular rows and each tipped by a bunch of grapes; but even where it is most clearly suggested certain elements drawn from the Date Palm are usually mingled in the pattern it forms, while many more purely architectural ornaments are ingenious and attractive combinations of Date-tree fronds and Grape-bunches. The Pomegranate is likewise easily recognized among the Sacred Tree emblems; and a very highly conventionalized design, in which each branching line is tipped by three cone-like objects, Dr. Bonavia believes to have been meant for a Fir-tree, while a small design on a seal shows tiny objects which look more like acorns than like anything else. There is a variety of evidence to prove that the Assyrians were doubtless acquainted with other species of Oaks besides *Quercus Libani* of the Lebanon mountains; yet, the author confesses, this particular Sacred Tree may also have represented a Vine with its fruit-clusters portrayed in an unusual manner.

Almost more interesting than his chapter on Sacred Trees is the one in which the author discusses the origin of the famous "Cone fruit," so constantly held in the hands of the personages figured on Mesopotamian monuments, because so many different opinions upon this question have prevailed. We cannot follow him through the many reasons he gives for his own belief, but can merely quote this belief as in favor, not of the well-known theory that the symbol represents the male inflorescence of the Date Palm, but of the idea that it is a Fir-cone used for the sprinkling of holy water. This idea seems to us well supported by the fact that the figures which hold a cone in one hand hold in the other a small bucket, and seem to be performing some act in relation to more important personages, and by the fact that the custom of using Pine-cones for this purpose still exists in the East. But the reader interested in the transmission of symbols or in the development of artistic patterns, should read this chapter of Dr. Bonavia's for himself, as also the extremely interesting ones in which he treats of the Lotus in art and of the origin of the ubiquitous use, in one conventionalized version or another, of the device which, when found in Mesopotamia, is called the "Assyrian luck-horns." These chapters, written to prove no preconceived theory, but simply to register facts, and, if possible, to deduct sensible interpretations from them, form an excellent antidote to Professor Good-year's widely read *Grammar of the Lotus*, which, despite the erudition it reveals and the extremely valuable material it brings together, must be regarded as a cleverly exaggerated piece of special pleading. Surely, not from the Lotus alone, but from the Lotus and many other floral and non-floral originals, the decorative motives of antiquity

must have been derived; and this truth, which should be self-evident, Dr. Bonavia's book helps greatly to establish.

We may merely note, as one of his most important and attractive deductions, the way in which he traces the fleur-de-lis, so long regarded as a floral emblem and as one of rather late European origin, back to the "luck-horns" of Assyria, showing us every step in the transition by means of pictures as well as of words, and showing us that, even in old Assyrian times, this transition had led up to the fully perfected forms of the fleur-de-lis—to the precise forms in which it is employed to-day.

Notes.

Some idea of the literary activity of the scientific staff of the Royal Gardens at Kew appears in the fact that last year about three thousand printed pages of botanical and horticultural matter emanated from that establishment.

A summer meeting of the American Forestry Association will be held at Springfield, Massachusetts, in connection with the forty-fourth meeting of the American Association for the Advancement of Science, beginning on Tuesday, September 3d, at two o'clock in the afternoon, and continuing through Wednesday.

Clethra alnifolia is still in full bloom, and, although naturally a swamp plant, it takes quite as kindly to cultivation as almost any shrub. This plant and its variety *tomentosa*, which blooms still later and keeps in flower until frost, are both very handsome native shrubs, with first-rate foliage and pure white, fragrant flowers. Almost every year we have commended them to planters, but this advice can hardly be repeated too often. If they were rare and expensive foreign plants they would be much better known in gardens than they now are.

Among the varieties of Apples which will flourish in the north-west the Hibernal is strongly recommended by the superintendent of one of the stations in Minnesota. The trees are robust and in good condition after having been set eight years; the fruit is large and ripens well together on the tree; it is equal to the Oldenburg for all culinary purposes, and in the proper season is relished as a dessert apple. The tree also has a great value as stock to be top-worked with more tender varieties, as it makes a smooth union with many kinds and is inclined to push them into early bearing.

In the interior of Florida the best pineapples are grown under a cover consisting of narrow strips of board set a few inches apart on stringers and high enough to allow a man to walk under it. This structure is weather-boarded on the north and west sides to protect the plants from cold winds, and the cover excludes some of the hot sunshine in summer. Under this shading the flowering can be controlled to some extent, and pineapples can be made to ripen nearly every month in the year. They are said to be much larger and to have a better flavor than those grown in the open ground.

A new vacuum process of canning fruits in glass has lately been introduced from Europe among the packers of the Pacific coast, and according to Mr. Charles H. Shinn, writing in the *American Agriculturist*, the tin can appears to be doomed. All the deleterious gases generated in cooking the fruit, and even the air, are extracted under this new process, so that fermentation is reduced to a minimum. No solder is used, and each jar is opened by making a puncture with a pen-knife, after which the cover can be lifted off entire. The fruit is solid-packed—that is, a can contains ninety per cent. of fruit and ten per cent. of syrup, instead of being two-thirds fruit and one-third syrup, as was formerly the case with tin cans. In this way there is a saving of freight charges, while the superior attractiveness and healthfulness of fruits packed in glass is evident. Formerly the use of resin, acid, solder and hot iron scorched the syrup, and since the aperture in the top of the tin cans was so small that the fruit was often crushed and cut when being placed in the cans, the syrup was for this reason cloudy. By the new method the syrup will be clean and clear and cheaper grades of fruit will be almost as good as the higher ones, especially where the difference is only in the size of the fruit.

Last week the corner-stone of the new hall for the Pennsylvania Horticultural Society was laid in Philadelphia, and

among the papers placed within the box sealed up in the stone were records of the Florists' Club, prepared by Mr. Edwin Lonsdale, and a history of the Horticultural Society prepared by Dr. J. E. Mears, Vice-President of the society. From an interesting résumé of these papers, published in the *Philadelphia Ledger*, it is said that this society, the first of its kind in America, received its charter in 1832, but was organized as early as 1827 as an outgrowth of the Agricultural Society which was organized in 1785. Its presidents, from Horace Binney, the first one, down to the present time, have all been men of distinction in the community; and its corresponding secretaries, David Landreth, Jr., John B. Smith, Thomas C. Percival, William D. Brickle, Thomas Meehan, Charles P. Hayes and Edwin Lonsdale, have all been leading authorities in horticulture. The society is well known throughout the country for its admirable exhibitions and for its progressive spirit. The new building will be the fourth one which has been known to Philadelphians as Horticultural Hall. The dimensions of the large assembly room will be seventy by one hundred feet on the second floor and will seat eleven hundred people. The friends of horticulture will unite with us in wishing that the staunch old society may enjoy a long career of prosperity and usefulness in its new home.

A few Alligator pears are to be found in fancy-fruit stores and command thirty to thirty-five cents apiece; Strawberry and Sugarloaf pineapples, from Havana, bring \$10.00 a hundred at wholesale, and in spite of the abundance of home-grown fruit, good Aspinwall and Port Limon bananas sell readily for \$1.00 to \$1.50 a bunch. Peaches of high quality are rather scarce since the Georgia crop has disappeared from the market, but some fine yellow-fleshed Crawfords are now coming from the Delaware peninsula, and the best ones command \$1.50 to \$2.00 a basket at wholesale. The practice of marketing peaches in baskets of smaller size, which can be handled like grape baskets and transported in large carriers, is growing in favor, and no doubt we shall soon see the last of the old-style basket. Hand-picked Duchess of Oldenburg, Gravenstein and Maiden's Blush bring the highest prices among apples. Fine Le Conte, Bartlett and Clapp's Favorite pears, from New Jersey and Maryland, dispute the market with the beautiful fruit from California, but the east now has nothing to match the Bradshaw, Columbia, Purple Duane, Yellow Egg, Hungarian and Victoria plums from the Pacific coast. Muscat and Tokay grapes are coming from California in quantities, while Delawares, Moore's Early and Wonders, from up the river, are now supplanting the Concordes and Niagaras from the south. Hard bright huckleberries are still sent from the Pocono Mountains, and command at wholesale ten cents a quart, and blackberries from New Jersey are worth as much. The warm weather, with seasonable rains, has pushed forward melons and all kinds of vegetables in such abundance that the market is fairly glutted with them, and the same condition seems to be found in many other parts of the country. A recent dispatch from California states that one day last week five hundred crates, each containing thirty fine canteloupes, from the Sacramento Valley, were dumped into the Bay of San Francisco because they could not be disposed of to the wholesale dealers for ten cents a crate. This certainly seems a criminal waste, especially when we are told that a good muskmelon could not be bought at a retail stand in San Francisco for less than twenty-five cents. Some way, surely, ought to be devised by which poor people could get some of this fruit at a reasonable rate, even if the business of the middlemen should suffer to some extent.

Henri Baillon, the distinguished French botanist and Professor of Botany in the Faculté de Médecine de Paris, died on the 21st of July in his sixty-seventh year. Baillon was one of the most learned, industrious and prolific of the modern French botanists and the chief apostle of the theories of his countrymen, Adanson and Payer. Unfortunate infirmities of temper, which led him into severe and sometimes unjust criticisms of his contemporaries, somewhat impaired his usefulness. He did, however, an immense amount of good work, and much of it of permanent value, and will always live in his classical *Histoire des Plantes*, his chief work, which, unfortunately, he did not quite complete; in his *Dictionnaire de Botanique*; and in his studies of the Madagascar Flora, upon which in late years he has been chiefly engaged. He also wrote much upon medical botany and on the flora of the neighborhood of Paris, and was author of a *Traité de Botanique*. *Adansonia*, a journal of botany, now discontinued, was edited and largely written by him.

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLE:—The Treatment of Small Seashore Places	341
The Social Use of Gardens	<i>John De Wolf</i>
Notes on Western New York Woodlands.—I	<i>Rev. E. J. Hill</i>
FOREIGN CORRESPONDENCE:—London Letter	<i>W. Watson</i>
PLANT NOTES:—The Hazels. (With figure.)	<i>J. G. Jack</i>
CULTURAL DEPARTMENT:—Fighting the Elm-leaf Beetle	<i>S. J. 340</i>
Transplanting <i>Kalmia latifolia</i>	<i>G. W. 347</i>
The Coral-trees	<i>N. J. Rose</i>
Notes on Bedding Plants	<i>W. H. Taplin</i>
Cauliflower for Winter	<i>William Scott</i>
<i>Rosa rugosa</i>	<i>N. R.</i>
CORRESPONDENCE:—Peach-growing in Nebraska	<i>Professor Fred W. Card</i>
Plant-breeding	<i>Luther Burbank</i>
Plant-breeding Once More	<i>Professor E. S. Goff</i>
RECENT PUBLICATIONS	344
NOTES	350
ILLUSTRATION:— <i>Corylus rostrata</i> , Fig. 48	345

The Treatment of Small Seashore Places.

WE recently said that more intelligence and self-restraint should be shown in planting the grounds of summer villas and cottages; and that, when these qualities are generally developed, our small places will be much more beautiful, as exemplifying the fundamental virtues of simplicity and fitness. Nowhere will this truth be more conspicuously shown than in the aspect of our seashore villas; for nowhere is local character more marked than in seacoast localities, and fitness, therefore, more imperatively demanded in the work of man; and, as a rule, nowhere is simplicity more sure to be the quality most desired.

Of course, seashore situations vary much among themselves. There are some, as on the sandbanks of Nantucket, where the rough, wind-swept, semi-barren natural aspect of the spot could hardly be entirely overcome by art even with a vast expenditure of pains and money. Here, a simplicity so great that it need hardly be called art at all seems prescribed. Here it is best to do as little as possible—to aim chiefly at a moderate degree of neatness, to plant only a few hardy vines to relieve the nakedness of the house itself, and to content one's love for beauty with the splendid panorama of the ocean itself. From situations like this the range is wide, up to those beautiful, varied, rocky and tree-clad regions, rough as compared with valley countries, yet rich in luxuriant undergrowths of shrubs, creepers and flowers, which form a great part of the northern New England shore, and to those others, lying along more sheltered coasts, like those of Long Island Sound, which may have almost, yet not quite, the same character as though they were not near the salt water at all.

In each of these good taste decrees that the local leadings of Nature should be followed by man in his attempts at improvement. Where Nature's plantations are luxuriant, luxuriance may be the planter's ideal; where she is parsimonious he should content himself with adding a little more, and not endeavor to make his place look as though he would have preferred to live where she had worked in quite a different mood. Even if, in such situations, he succeeds in growing garden trees and flowers better than might have been expected, and even if, intrinsically considered, they are well disposed, still he may not

achieve genuine success; for even pretty plantations may look as inappropriate and inartistic, in a region naturally devoid of much vegetation, as would a treeless place in the Connecticut valley. If a planter protests that he loves luxuriant vegetation, cannot live comfortably without much shade and many garden flowers, and dislikes the open, airy, empty look characteristic of many stretches of seashore, then the only answer is that he had better settle in some other spot. The real lover of Nature sees that these breezy seashore stretches have a beauty of their own which can easily be spoiled by man's tampering hand, but cannot really be transformed into beauty of another kind. And it is pleasant, once in a while, to find an instance where this beauty has been perceived, respected and enhanced, instead of being denied and spoiled, by the owner of a summer house.

We have in mind just now two summer villas of an expensive class which stand next one another on a beautiful reach of seacoast near one of our largest New England watering-places. The outlook is south-easterly, and the coast line is formed by long, smooth, sloping shelves of reddish rock, strewn with picturesque boulders, over which the waves break in magnificent masses. Where the adjoining soil has not yet been improved it shows stretches of flat meadow, or of old pasture-land bearing scattered rocks and growths of low shrubs and vines. Where it has been improved, many varieties of taste are revealed, many differences in treatment may be noted. But the two contiguous places to which we especially refer exhibit the extremes of intelligent self-restraint and of unintelligent self-indulgence, in both architectural and gardening art.

In one, the house, which stands quite close to the rocks, is very large, but long and low, as it should be to harmonize with the level lines of ocean and shore, and is devoid of the strongly accentuated features which are over-conspicuous in such situations; its roofs are red and its walls are of gray weather-colored shingles; and it is covered with vines, chiefly Japanese Ivy and Honeysuckle, and set closely about with shrubs, to a degree which suffices to bind it agreeably to the soil and prevent any look of bareness, and yet does not destroy its architectural character or give it the air of being smothered in foliage. With this exception nothing has been done to the place (which contains some twelve or fifteen acres) except to plant vines also along the low stone wall that divides it from the highway, and to cover its slightly rolling expanse, here and there broken by low masses of rock, with well-kept grass. No result could be more simple; but in such a situation it is beautiful. It shows as plainly as the most elaborate plantations the careful guardianship of man, and it satisfies the mind as well as the eye, proving that those who wrought it appreciated the chief attractions that Nature had bestowed upon the spot—its magnificent outlook over the sea, and its openness to refreshing breezes, so tempering the sunshine that the shade of trees is not required.

Adjoining this we find a place rather larger in extent, where the ground is much more broken and rocky, and where, in consequence, a still higher, because more picturesque, degree of beauty might have been attained by a suitable method of treatment. But here the house is lofty as well as large, and is contorted with eccentric features. Every part of the place is cut up with paths and shrubberies, clumps of trees, flower-beds and small architectural constructions, and even the stable looks as though it had tried to be a little mediaeval castle. Not far from the highroad rises a huge rounded rock; by its base runs the approach to the house, and on the other side of this a stone turret has been built, which assists the rock itself to support an ornamental iron gate. Moreover, a stairway climbs around the turret, and a bridge has been thrown across, above the gate, from the turret to the rock, thus producing a purposeless structure as ugly in effect as it is aimless in conception. And between this structure and the highroad, along both sides of the driveway, are crowded plantations of hardy flowering plants—a flower

garden just where it should not be, away from the house, exposed to the dust of the roads and to the easy depredations of any passer-by. An immense amount of money must have been spent upon this place—many times as much as has been expended next door. But it has all been spent in doing what ought not to have been done. The result is far less pleasing than if the spot had been left in its natural roughness, for now it has no dignity and no consistency with its surroundings. Over-elaboration and trumpery adornment are always out of place, but they appear especially feeble and petty and vapid in the presence of the strength and sublimity of the sea.

The Social Use of Gardens.

WHY do we not have more garden parties; or, rather, why do we not have more gardens where parties worthy of the name can be held? During our warm American weather all other entertainments seem insignificant beside the elegance and beauty of an open-air reception with gardenesque surroundings of fitting character. Attractive people may successfully entertain their friends in a bare lot, but they will find it easier, and appear themselves to even better advantage, with surroundings of shade trees, soft lawns, flower-scented air, sun-lighted fountains and beds of blossoms. Accompaniments of this sort help to inspire and develop the thought and sentiment suited to festive occasions. There is no limit to the richness of the setting that can be given to outdoor entertainment. Music is never sweeter than in the open air, and the histrionic art is never more effective—as has been proved from the days of Grecian poets to those of our own actors—than it is with a greenwood background.

Gardens for entertaining must be gardens in a broad and true sense, not mere collections of plants. They must be fitted for human enjoyment rather than for the production of crops of flowers. The most elaborate of temporary decorations appear commonplace beside the living verdure and fragrance of a well-ordered garden; no tapestry or embroidered hangings can compare in grace with vine garlands and banks of foliage, and the shade of a silk pavilion is vulgar when compared with that of a noble ancestral tree.

The formal style of gardening is in many respects well adapted to social festivity, but it is not essential. Gardens for such a purpose need not be of great size, for we cannot hope to rival Versailles or Hampton Court, but we can have open spaces of grass, broad walks shaded by trees and bordered by masses of shrubbery and flowers. Only the very wealthy can afford grounds which rival in splendor those of royal villas. It is not possible for all of us to have noble avenues, broad terraces and elaborate gardens, but all who have gardens of any kind can so arrange them that they will be pleasant places for receiving our friends.

With our varying seasons we should live in the open air whenever it is possible, and when it is pleasant no country on the earth has more bracing weather than the eastern United States. For an impromptu party a delightful day is often the only excuse needed, but elaborate functions, where invitations must go forth some time before, may be marred by capricious weather. To afford shelter from showers and for various other reasons garden structures should have an important place in garden plans. These structures may range all the way from rustic arbors to elaborate banqueting halls with all the charms of architecture and furniture that designers can create, but the most desirable for American homes, it seems to me, is the old-fashioned summer-house, built in a style to correspond with the main structure, but detached and set in some pleasant part of the grounds in such a way as to have the charm of a separate place. Perhaps, the most useful service these have rendered from colonial times until now is as summer-parlors, where the family can enjoy the society of friends amid surroundings that enhance the delights of summer more than our winter quarters can do. As they

are likely to be used more continuously than any apartment in the dwelling while warm weather lasts, there seems no good reason why thought and labor and money should not be expended upon them according to the ability of the owner. A musical family would naturally give such a place somewhat the character of their tastes, and musical instruments would become a permanent belonging. Those who love to entertain at luncheon would like it more of a dining-room, and the five o'clock tea would rarely be taken elsewhere. An abundance of seats to accommodate the company, large or small, is essential, and furnishings intended for permanent garden use are more in favor than those brought out for a temporary occasion.

Even now no places are more attractive than our many gardens, from the first profusion of roses in June until the rich autumn colors fade into the gray of November. If our lives become more intimately associated with our gardens the benefits to each will be mutual, and the results will have a noticeable bearing on the social habits of the country.

New York.

John De Wolf.

Notes on Western New York Woodlands.—I.

THE changes made in the amount and character of the forest covering of western New York within the past fifty years have been very marked. Though the section was old in the middle of the century when compared with the regions farther west, it still retained much woodland which has since been cleared. The land had mostly gone into the hands of settlers in the first quarter of the century, and the rapid removal of the timber had ceased, except in the Pine-lands of the hills which form the northern terminus of the Alleghanies. The pioneers and the children who generally succeeded to their fathers' estates, grew tired of their long struggle to subdue the wilderness, or deemed a generous supply of timber necessary for the farm. Hence there came a lull in the clearing process when trees enough had been removed to suit the immediate demands of agriculture.

The region generally is one of hills and valleys, and few farms were devoid of swampy land. Though the soil of the swamps was rich, it was costly work to drain them. The timber of the swamps was extra large and heavy, and this made it more toilsome to clear them, so the trees in the swamps were spared longer than those on the drier uplands or on the hills. Then a good amount of swamp-land was required for the oak and black ash it furnished for fence timber, for the old-time rail fence made liberal demands upon the forest. The timber of the upland in the best agricultural sections was largely beech and maple, which made the best of firewood, and an abundance was left for this purpose. The fire-place was still used extensively, and it demanded more wood than the stove that was supplanting it. Nearly every farm, too, had its sugar-bush, whose annual tapping was a matter of necessity, for the sugar for the household principally came from the Maples, and this fact protected the trees. As the Muscovado and the white sugars became cheaper, however, and labor more costly, less maple sugar was made, and many sugar-bushes were cut down. The increase in the price of maple sugar has of late rather stimulated its production, and where trees enough are left it has become a matter of profit once more, and the destruction of the Sugar Maple is again checked. The use of wire for fencing has decreased the demand for timber, except for posts, and even iron is taking the place of these in many cases. So the preservation of trees for rail timber has nearly ceased, although oak and chestnut are still required for posts.

As the cities and villages sprang up there came an increased demand for firewood and charcoal, and the forests left by the pioneer were more and more curtailed. With much of the labor done in the winter, the coal-pit and the cutting and marketing of wood became profitable to the farmer. This continued till mineral coal checked, and has finally

largely supplanted, wood as fuel. The price of wood did not increase, and the greater cost of labor lessened the profit so much that it checked further clearing. Though an occasional piece of woodland may now be cleared, the limited call for wood is generally met by cutting the older trees and by thinning the woodlands.

Still another cause has worked unfavorably to the forests, and somewhat curiously shows the operation of economic forces. As the children of the farmer grew up, many of the sons left their homes for the cities, or sought their fortunes in the west; many farms were therefore sold, since they could not be profitably worked by hired help alone, and the proceeds of the sale generally furnished a competence to the owner. They were mostly sold subject to a mortgage, often a heavy one. Under such conditions much timber was cut and sold to pay the debt or to bring more of the land under cultivation. Farms with a large amount of woodland were purposely bought with this end in view. Some, on which fifty years ago the proportion of forest to cleared land was from a fourth to a third, have been nearly stripped of timber, so that now not a tenth part is woodland. It was at times a fruitless struggle on the part of the debtor, and the farm came back to the mortgagee with its condition greatly changed. It is safe to say that the forest-covering has been reduced to one-fourth the area it had fifty years ago. This is taken as a point of departure for comparison, partly because the land was at that time largely in the hands of the first settlers or their children, and partly because my observation goes back to about that time. Account has not been taken of forest fires, although local damage has often been occasioned by them. The timbered areas are too circumscribed and the population too dense for fires to gain much headway. The worst fires to deal with are those which get established in peaty swamps in a time of drought, which slowly eat their way along and usually persist till they are drowned out by fall rains or smothered by a covering of snow. Nor is account taken of pasturing the woods. The damage from these two causes results more in the thinning of the forest-covering than in the reduction of its area.

Chicago, Ill.

E. J. Hill.

Foreign Correspondence.

London Letter.

CRINUM PURPURASCENS.—According to information recently received at Kew, this *Crinum* is practically aquatic in its habits. It grows in rivers and lagoons near the mouth of the Niger River, on the west coast of Africa, the Leek-like bulbs buried in mud often three feet below the surface of the water, and the long strap-shaped, partially submerged leaves are so altered in character as to resemble certain sea-weeds. This species was first introduced into cultivation in 1877, when it flowered at Kew, and was figured in *The Botanical Magazine*, t. 6525. It continued to be an exceedingly rare plant in gardens until about five years ago, when the late Mr. F. Horsman, of Colchester, introduced a quantity of it. At Kew it is grown in pots in a stove and treated the same as any ordinary *Crinum*, except that a saucer holding water is placed under the pot while the plant is in active growth. Now, however, it is to be tested as an aquatic. It has crowded umbels of stellate flowers about six inches across, white, tinged with rose, and very fragrant. It blooms all through the summer.

HEMANTHUS KATHERINE.—This is a magnificent greenhouse bulb easy of cultivation, and producing annually umbels of rosy scarlet flowers as large as a child's head, and lasting about a month. I am certain that if some enterprising nurseryman in the southern states were to grow this plant by the thousand he would find as ready and large a market for it as the Bermuda Lily has now. It can be multiplied by means of bulb-scales in the same manner as Hyacinths, and it produces seeds freely. There are three large heads of the flowers in the Cape-house at Kew now, and I am surprised at the large number of horticul-

turists who are unacquainted with it. They in their turn are astonished when informed that the plant has been in cultivation in England nearly twenty years (it was introduced from Natal by Kew in 1877), and that it is one of the handsomest and most manageable of all the fine bulbous plants which we owe to south Africa.

DENDROBIUM PHALENOPTIS.—So far this plant has been practically a perpetual flowerer. We have never been without its blooms since it was first introduced in quantity. Whether this is due to the plants having been obtained from various importations received at different times of the year I cannot say, but, at any rate, its behavior so far has been quite exceptional for a *Dendrobium*. Our plants are grown in the hottest and moistest house we have, and they are placed on a shelf close to the highest part of the roof-glass, where they get comparatively little shade. Here they grow well, forming pseudo-bulbs from a foot to eighteen inches high, which flower as soon as they are mature, and not resting for a time as most of the *Dendrobiums* do. After the flowers fade the plants are not watered for a few weeks, when new growth appears, and the hot moist treatment is repeated. We have no tropical Orchid that will keep on flowering like this. May one again appeal to growers to drop the name *Schroederianum* for this plant? It is simply *D. Phalaenopsis*, a variable species, as we now know it, but requiring no third name, except in the case of individual varieties, such as *album*, etc. There are more plants of this *Dendrobium* in cultivation now than of any other species, except, perhaps, *D. nobile*.

SOBRALIA VEITCHII.—This is a hybrid raised last year by Messrs. J. Veitch & Sons from *Sobralia macrantha*, crossed with *S. xantholeuca*. The flowers are as large as those of the latter species, white, tinged with lilac, the lip more deeply shaded with lilac, with a blotch of yellow in the throat. A plant now flowering at Kew, and obtained as *S. xantholeuca*, is practically identical with the hybrid raised by Messrs. Veitch, and as the two parents are found growing together wild, there is no reason why nature should not have anticipated the nurserymen and made the same cross. I believe there are more species of *Sobralia* admitted than is warrantable, some of them having no other distinguishing character than mere flower color. A plant of *S. xantholeuca* now flowering at Kew differs from the type in having brownish red blotches on the front of the lip, a difference which was looked upon by a distinguished orchidist as "almost sufficient to constitute a new species." There are many such among Orchids.

TWO NOBLE BEDDING PLANTS.—One of the most beautiful pictures to be seen out-of-doors at Kew this year is a round bed twenty feet in diameter, filled with *Galtonia candicans* and *Gladiolus Brenchleyensis*. The bed is in an open position on one of the lawns close to one of the principal entrances, no other flowers being near it. The *Galtonia* spikes are about three feet high, the *Gladiolus* a little shorter, and they are so thick that no soil can be seen, nothing but a great mass of bright scarlet and nodding bells of white. The production of such an excellent effect is very easy; a sovereign, about, would purchase the bulbs, which should be planted early in the spring in good soil, but not in strong manure, which is often fatal to bulbous plants, especially of the *Gladiolus* kind.

PAULOWNIA IMPERIALIS is a grand plant to use for subtropical gardening. At Kew it is planted in a very large oblong bed, on a lawn sheltered by a shrubbery on the north side and exposed to full sunshine on the south. The plants, which are about three years old, were cut down to within six inches of the ground in early spring, and when they started to grow all the buds except one on each plant were removed. Watered in dry weather and mulched with manure, they have grown to a height of four feet, and the beautiful palmately lobed leaves are each from a foot to eighteen inches in diameter. It is impossible to have anything more effective as a foliage-plant when seen in the mass than this. *Ferdinanda eminens*, *Castor Oil*, big-leaved *Solanums*, *Wigandia Caracasana* and similar large-

leaved plants, used for the same purpose, are not equal to this. Of course, the leaves are much smaller when the plants are allowed to grow up into trees; it is only when treated as above that they produce such large leaves. I have heard of plants thus treated which produced leaves two and a half feet across.

SENECIO JAPONICUS.—A few weeks ago I told you of a very striking species of Senecio grown in the open air at Kew, namely, *S. macrophyllus*, a Caucasian plant. Almost as striking, and at the same time of totally different habit, is *S. Japonicus*, or rather a giant form of it, which is grown at Kew by the side of the type. The variety has pedately divided leaf-blades eighteen inches across, elevated on stout erect cylindrical petioles three feet high, the whole leaf being remarkably similar to the leaf of a gigantic *Arisaema*. The stems, which bear smaller leaves, rise erect to a height of six feet and bear terminal clusters of orange-yellow flowers, each about three inches across. The flowers began to expand three weeks ago and there is still a fine display. I suspect that this plant would attain to still larger proportions if grown as a subaquatic. It is perennial, quite hardy, and was introduced from Japan in 1866. Another name for it is *Erythrochoete palmatifida*.

DATURAS.—Some of the annual species of this genus are handsome enough to use for summer bedding, in large gardens and parks at any rate. At Kew two species are thus grown, namely, *Datura meteloides* and *D. fastuosa*. The former, which is a native of California, here grows about two feet high and bears white flowers, sometimes tinged with purple and larger than the flowers of the well-known greenhouse *D. suaveolens*. By removing some of the leaves the flowers are well exposed, and in sunny weather the beds are crowded with the big white trumpets. *D. fastuosa* is a most variable plant, and all its varieties are beautiful. The so-called new *D. Cornucopia* is merely a form of this. All the double or hose-in-hose varieties are worth growing, and they come true from seeds. We find it advisable to sow the seeds in March in a frame and grow the plants in pots till June, when they are put out in the beds. A cold, wet summer is against their good behavior, but such a hot, dry season as we have had here has been in their favor.

London.

W. Watson.

Plant Notes.

The Hazels.

ONLY two distinct species of Hazels, or the genus *Corylus*, have been generally recognized as native in North America north of Mexico; but Dr. J. N. Rose has recently pointed out (*GARDEN AND FOREST*, viii., 263) distinctions which he considers are sufficient to establish a separate species heretofore regarded as a west coast variety of *C. rostrata*, and known as *C. rostrata*, var. *Californica*. The Beaked Hazel, *C. rostrata*, is common over a wide territory in the eastern United States and Canada. Growing over much of the same region, but apparently not extending so far north, is found the other American species, *C. Americana*. This, in fruit, is readily recognized by the broad leafy, more or less glandular hairy husk or involucre which incloses the nut; and without fruit it may generally be known by its glandular bristly young twigs, its broader, rather thicker, rougher and coarser leaves, which often have some short glandular hairs on the upper surface and on the veins beneath; by its larger and stiffer and coarser habit of growth, and in winter by its much longer, stalked, nodding or pendulous male catkins. *C. rostrata*, in fruit, is at once recognized by the densely bristly, more or less tubular husk or involucre which grows over and above the nut. When fruit is not present for identification the plant may be known by its thinner, narrower, more pointed leaves; its more slender branches and general habit of growth; by its young twigs, which are either glabrous or nearly glabrous, or are thinly covered with soft, more or less appressed glandless hairs. In

winter the plant may be distinguished by its short, nearly sessile or stalkless, erect catkins. It appears to be harder and to grow farther north than the other.

As Dr. Rose has given a technical description of *Corylus rostrata* in the article referred to, it is unnecessary to add more here in description of the species or explanation of the drawing (see page 345) made by Mr. C. E. Faxon.

The figure shows some of the variations which may be found in the shape and appearance of the fruit as it grows in New England. Occasionally plants are found with the husks much split, exposing the nuts. The sweet edible nuts also vary somewhat in size and shape. They are often collected for eating, but the dense covering of slender, rigid, deciduous bristles by which the involucre is protected renders the collecting of the fruit a disagreeable work, as the bristles easily penetrate the skin.

In the large Oak family, or *Cupuliferae*, in which the Hazels have usually been classed, they appear to have closer affinities with the Hornbeams, *Carpinus*, and the Hop-Hornbeams, *Ostrya*, than any other familiar genera. The analogies will be noticed more particularly in a comparative study of the flowers and fruit. The male or staminate flower-buds in the form of catkins are exposed and conspicuous on the Hazels during winter, while the female or pistillate flowers are concealed within axillary scaly buds. The female flowers are mostly, but not always, in buds nearer the apex of the branch than the male blossoms. At least, this is true with *Corylus rostrata* and *C. Americana*, but the latter commonly has a cluster of male catkins at the apex of a twig, with female flowers intervening between the male blossoms lower on the branch. They may, however, be more or less intermixed, and on some foreign species female flower-buds may be found growing on the base of the stalks of male aments.

With the first warm days in spring the male catkins elongate and mature pollen, and from the female flower-buds there are protruded a number of short thread-like dark red styles which receive the pollen that eventually fertilizes the ovules. After flowering, the plant seems to remain nearly dormant for a considerable period, sometimes two or three weeks, after which more evident growth is developed. Watching the progress of the buds and young growths it will be found that the some-time fertilized female flowers are carried out on the tips of new leafy shoots, and the shoots are well grown before the female flowers or young fruit make any visible development or become at all noticeable on the extremities. It is unusual among our trees and shrubs to have blossoms produced from axillary buds on old shoots so early in the season, and have these buds afterward develop into leafy branches several inches long, bearing the fruit on the apex. *Carpinus* and *Ostrya* are somewhat analogous, but in these the young twigs have burst from their buds and have made some growth and produced leaves before the flowers are fertilized.

In most trees with which we are familiar the flowers and fruit are either produced on the old wood or on new growths, the flowers developing with or after the new branches. Little that might be called an ovary and no ovules can be detected in the Hazels until long after the plants have flowered or until the foliage has become well grown.

The development of the flower and fruit of the Hazel is interesting and well worth attention. The male catkin is composed of numerous flowers inserted on the under side of overlapping bractlets, each bractlet bearing a single flower composed of about four divided stamens which appear to bear eight anthers, but these are generally assumed to represent half anthers which have become separated. Each scaly bud producing pistillate or female flowers bears from two to half a dozen or more blossoms, forming what may really be regarded as a densely crowded head or spike. Each flowering scale, in the female cluster, bears two flowers side by side on the inner surface, each blossom bearing two styles. The flowering scale or bract is more or less accrescent and may be found much

enlarged and leaf-like at the base of the mature fruit. What finally forms the leafy husk or involucre around the nut exists around the young ovary as a little girdle or two tiny scales with laciniate edges.

developed nut and involucre attached to the same bract; or both flowers may be abortive, their place being indicated in late summer by the enlarged bract and involucres crowded among the fully developed fruits.



Fig. 48.—*Corylus rostrata*.—See page 344.

1. Flowering branch. 2. Scale from male ament. 3. Stamen. 4. Bud with female flowers. 5. Scale with two female flowers. 6. Pistil. 7. Fruiting branch. 8, 9, 10, 11. Different forms of fruit. 12. Winter branchlet.

Very often one of the two flowers on the bract is not fertilized or does not develop, but the involucre grows considerably and may be found crowded near the base of its companion flower and ovary, which has grown into a fully

Among many interesting Japanese plants which are identical with or nearly related to our eastern American species, there is a Beaked Hazel very similar to ours, and which the botanist Maximowicz regarded as a variety of it,

naming it *Corylus rostrata*, var. *Sieboldiana*. It has the long tubular beaked, bristly fruit of the Beaked Hazel, and herbarium specimens show that it is nearly like ours in twig and leaf, but some specimens show both appressed simple hairs and erect glandular hairs on leaf-stalks and young twigs.

Arnold Arboretum.

J. G. Jack.

CELTIS OCCIDENTALIS.—This tree, which is variously known as the Hackberry, the Sugar-berry and the Nettle-tree, extends across the continent from the St. Lawrence to eastern Washington, and from Florida to northern Mexico. Like the Red Cedar and other trees of almost continental distribution, it varies greatly in habit. In southern Indiana and other points of the valley of the lower Ohio, it reaches a height of one hundred and thirty feet, with a straight, slender, smooth-barked shaft, which is often eighty feet high to the first limb. In some places it is reduced to a low shrubby form; in others it has a short stout trunk and widely spreading and pendulous branches. In New England it is a comparatively low, broad, round-headed tree, with branches sometimes pendulous, and as it appears in Hudson County, New Jersey, just across the river from this city, it has usually a broad flat top, with branches arranged in horizontal strata. Some account of the variations of this tree can be found in vol. iii., page 39, of this journal, where it is described and figured. At this season, when the leaves of so many trees are browned by fungi or eaten by insects, the light green foliage and airy habit of the Hackberry make it conspicuously beautiful. In large places, where a variety of arboreal growth is desired, it should not by any means be neglected, for it grows rapidly and endures well the trials of our frequent midsummer droughts. The leaves remain late in the autumn and turn to a light yellow before they fall, and it is altogether a cheerful-looking tree. *Celtis Mississipiensis* is another species of Hackberry found from southern Illinois southward. Where it is associated with *C. occidentalis* in the lower basin of the Ohio River it is the smaller tree, but its good habit and rapid growth make it desirable for ornament in those parts of the country where it flourishes, and it is now very generally planted as a street tree in the towns and cities of central and western Texas.

HYPERICUM.—Shrubs of this genus, although they are somewhat stiff in form, vary in habit from erect to prostrate, while their bright flowers, which continue to appear for a long time, make them a most useful and interesting class of plants at this season, when comparatively few other shrubs are in bloom. Of our native species *Hypericum prolificum* and *H. Kalmianum* are about equal in ornamental value, the latter having golden-yellow flowers an inch across, while those of *H. prolificum* are smaller, though more abundant. *H. prolificum* is rather the more graceful of the two and more graceful in habit than *H. aureum*, which bears large flowers one and a half to two inches across, with orange-yellow petals, and keeps in bloom throughout late July and August. *H. densiflorum* is closely allied to *H. prolificum*, and has fine foliage and bears comparatively small flowers in great profusion. *H. galliooides* and *H. adpressum* are practically herbaceous plants, although woody at the base. Mr. Jackson Dawson suggests that *H. adpressum* is admirably adapted to work in with the shrubby species, as it will form a low dense carpet covered with small golden-yellow flowers. A group of shrubby *Hypericums*, with *H. adpressum* closely occupying the space between them to a height of six inches, would make a novel and attractive foreground for large park shrubberies. Of the foreign species the half-woody *H. calycinum* is most satisfactory, for, although the low stems are killed back every winter, flowering shoots come up from the creeping root-stalks. *H. hircinum* is nearly two feet high and blooms in mid-summer. *H. patulum* and *H. oblongifolium* are Asiatic species which are quite hardy in the middle states. The new hybrid *H. Moserianum*, which was obtained by cross-

ing *H. calycinum* and *H. patulum*, has been found hardy enough to winter in sheltered positions in this latitude if it is protected with some light litter. It grows to a height of about two feet and bears in great abundance flowers which are three inches in diameter and of a clear yellow color through the summer and autumn months.

LONICERA SEMPERVIRENS.—The Trumpet Honeysuckle is one of the prettiest of our native twining shrubs, and one of the handsomest of all the climbing Honeysuckles. It is in flower now, as it has been since early June, and will continue to be until frost. The well-known trumpet-shaped flowers are nearly two inches in length, bright red on the outside, yellow within; quite a number of them are produced in whorled clusters from the axils of the leaves. The plant requires a little attention to make it do its best, and the situation it seems to delight in especially is against a wall or fence facing south. A rich porous soil to a depth of about two feet and plenty of water in the growing season will be found to suit it exactly. Its name indicates that the foliage is evergreen, but this is only true in the southern states, and it is deciduous in this latitude. The bright red or orange-colored berries are distinct additions to the beauty of the plant. It may be increased at this time of the year either from cuttings or by layers.

DAPHNE INDICA.—This plant is well known for its value in decorating conservatories, and, although its habit is not of the best, it is indispensable for the beauty and fragrance of its flowers, as they serve long and well when cut. Mr. Oliver writes that the shrub has endured the winter out-of-doors in the vicinity of Washington, where the mercury often falls below zero. He knows of plants which have stood out without protection for five or six years, and they are not only thoroughly at home, but they bear flowers much more abundantly than the specimens usually found in greenhouses. The plants, which are of both the white-flowered and red-flowered varieties, grow near the top of an elevated piece of ground on a southerly slope and in a sandy loam, where the drainage is perfect. It would be interesting to know just how far north this plant will flourish out-of-doors, for, wherever it will survive, it will be a splendid addition to our shrubberies.

DIERAMA (SPARAXIS) PULCHERRIMA.—This plant, like most of the other species in this section of the Irideæ, is a south African plant, and is figured in *The Botanical Magazine*, t. 5555, as *Sparaxis pulcherrima*. It is an evergreen bulbous plant, and is said to prefer wet places in its wild condition. Its leaves are two or three feet long, robust, stiff and leathery, and the flower-stalks are six feet high. Mr. Edmund D. Sturtevant writes that the plant flowered with him in Los Angeles, California, during the month of July, and it pleased him exceedingly. It is growing in rich black loam, and is never dried off. As it grows in California the bell-shaped flowers are suspended from almost invisible thread-like stems along the upper portion of the stalks. There are several on each stem, and they open in succession. They are rich deep pink, sometimes shaded with crimson, and have a grace which can hardly be described.

Cultural Department.

Fighting the Elm-leaf Beetle.

WHILE it is possible to destroy the larvae of the imported Elm-leaf beetle with a hand-spraying pump, a powerful one is needed to reach the tops of high trees, and it is a good deal of trouble to get the discharge-pipe lifted high enough by any device so that the spray can be directed effectively to every part of the tree. Much more powerful appliances are needed where many large trees are to be cared for, and a recent bulletin of the New Haven experiment station confers a public service by describing an outfit constructed by Stephen Hoyt's Sons, of New Canaan, Connecticut, where it has been used for two seasons with success.

A portable steam-engine of eight or more horse-power, with a double-acting force-pump and a tank holding two hundred and fifty gallons or more, are mounted on a stout wagon with a platform large enough to accommodate an engineer. An

indicator connected with the force-pump shows the water-pressure, and a number of outlets, four, six or eight, are connected with as many lines of hose as may be practicable. Hose guaranteed to stand two hundred pounds pressure to the inch can be had of the Mineralized Rubber Company of this city, at twelve cents a foot. The McGowan nozzle, made at Ithaca, New York, and costing \$1.10, is the best for producing a fine spray, and with 180 pounds of steam-pressure it throws a shower vertically for thirty feet or more. Some form of agitator should be used to keep the materials forming the poison-drench uniformly mixed in the tank. Besides the horses needed to bring this apparatus into position, a driver who can operate the agitator, an engineer and four or more, sometimes as many as eight men, to manage as many lines of hose, with an assistant to charge the tank, constitute an effective force. A man with creepers ascends a tree, carrying a stout cord, and choosing a good position in a crotch hauls up a line of hose and fastens it to the limb so that by holding the hose near the end he can direct the nozzle on every side. When the power is applied, the poison-spray, by skillful handling of the nozzle, is quickly applied to all parts of the foliage. To avoid waste of material the nozzle is held only a moment toward any one point, and two or three minutes at the most are required to finish the work of a large tree. While two or more men are directing the spray into as many trees, the same number are climbing adjacent ones, so that the engine and its attendants are fully occupied.

The first spraying should be made in May as soon as the leaves are half-grown, to destroy the beetles before they deposit their eggs; the second in June, when it is seen that the eggs which have been laid are hatching out. This is the most effective method of combating this pest, and it should be kept up for several years. Trees which lose even more than half of their sound leaf-surface may survive the attack for one year, but they will be destroyed beyond remedy by the beetles and worms that will attack them next year unless a well-organized campaign for their suppression is undertaken early next spring.

If the spraying of the trees is impracticable, efforts must be made to destroy the pupæ on or beneath the trees. This is done by sprinkling the kerosene emulsion over the ground under the trees through a watering-pot. The application does not injure the grass, and it should be made in sufficient quantity to saturate the soil where the pupæ exist. By examining the ground, the grass, the falling leaves, etc., under the trees the pupæ can be found, and the proper time for applying the emulsion, as well as the extent of ground which demands treatment, can be ascertained. The soft yellow pupæ in this latitude will be found on the ground from the middle of June to the middle of July or later. The application should be made as soon as they are observed, and repeated, if necessary, to destroy them. To be thoroughly effective this method should be practiced every year. The rough outer bark of the tree for some distance from the ground should be scraped, as many pupæ are likely to be concealed in the crevices, and the scrapings should be burned or drenched with kerosene. Many ascending worms can be intercepted by a band of hay an inch thick and eight inches wide secured to a scraped trunk at a convenient height from the ground by the aid of a six-inch girth of cheap cotton cloth, which is first tacked by one end to the bark, and, after packing the hay under it around the tree, is fastened at the other end by pins. As often as the hay becomes stocked with larvæ and pupæ the band (not the naked bark) is hammered with a mallet, which crushes most of the vermin. The hay, with any live insects, is then burned and replaced by a new band.

New Haven, Conn.

S. A.

Transplanting *Kalmia latifolia*.

To move plants of *Kalmia latifolia* from their native woods and use them for beautifying public grounds has been considered a difficult operation, and, undoubtedly, it is, unless proper care be exercised in the work. At Twin Oaks, the estate of Gardiner Hubbard, Esq., during the past winter the gardener, Peter Bisset, has been successful in moving about four thousand plants from the surrounding woods and placing them along drives and walks among such plants as Rhododendrons, Indian Azaleas and Japanese Conifers. The Kalmias at the time of lifting were from a foot to eighteen inches high. The work was done, as weather would permit, from the middle of November to the end of December. During all of that time the ground was wet, many of the plants being moved when the snow was on the ground. Care was taken to have the soil in which they were planted as much resembling that in which they were growing as possible; if a hard stony patch was struck, the holes were prepared beforehand with soil con-

taining a large amount of vegetable humus. All of the plants were moved with as large roots as possible. Notwithstanding the hot dry spells of the past few months, there have been only a few dozen deaths among the plants; the remainder are in a wonderfully good state of health, having made growths which compare very favorably with those of plants growing naturally. All the flower-buds were nipped off just as soon as they could be got at. Mr. W. R. Smith, of the Botanic Gardens, has also successfully moved a lot of Kalmias from their native wilds, but the plants in this instance were smaller. As soon as received they were potted into four and five inch pots and plunged in a cool frame for a year, where they have made a good growth, filled the pots with roots, and are now in good condition for planting out this fall.

Botanic Garden, Washington, D. C.

G. W. O.

The Coral-trees.

THE Erythrinæ, or Coral-trees, unfortunately so seldom seen in our gardens, are among the most showy flowering plants of their order. They are chiefly subtropical trees and shrubs with large trifoliate leaves and long terminal or axillary racemes or spikes of scarlet flowers of various size and shade. Of course, none, except, perhaps, the beautiful Cherokee Bean, *Erythrina herbacea*, is hardy in any of the northern states, but a few of the exotic species may be successfully grown for summer decoration in the garden, either for the sake of the rich glossy foliage or because of their gorgeous flowers. The best of these and the easiest to cultivate successfully is *E. Crista-galli*, a species with herbaceous shoots, flowering during the summer or early autumn months, according to treatment and location.

The Coral-trees are widely different in growth and habit. Some are arborescent species, indigenous to the Cape, the East Indies and the South Sea Islands; others are frutescent or herbaceous. These latter are common in the West Indies, and are represented in the United States by the above-mentioned *Erythrina herbacea*, a small and delicately beautiful plant common in the Pine-lands of the south from Florida to Carolina and Virginia.

The herbaceous forms, which annually throw up strong, succulent shoots terminating in a long and brilliant raceme of flowers, should be stored in a dry, cool place during winter until the frosts are over, when they may either be simply planted out in a very rich and well-dug border in a sunny position, or they may be potted and started in a greenhouse in moderate heat, to be planted out as early as the weather will permit. After planting in the open air these kinds will generally take care of themselves and flower profusely in season, provided the soil is rich and the plants are not suffering for want of water. In France, where *Erythrina Crista-galli* and especially *E. Bidwillii* are largely grown for the market, the plants are started in gentle heat and planted out quite early in beds which are mulched with a deep layer of well-decayed horse-manure. Here they are cared for during the summer, watered profusely during dry spells, and the shoots are tied to neat sticks so as to render the plant even and uniform. From three to five shoots are allowed on each plant. The plants are lifted and potted in September or October before the flowers expand, and when established are sold in the open markets and by florists for window decoration.

The woody species produce their flowers from the young wood of the previous year, and care should be taken not to prune the plants until the flowering season is over. When the season's growth is finished, the plants are gradually dried off and allowed to lose their leaves. In this dormant state they are stored in a cool, dry place until early in the season when they are looked over, cleaned, and potted if necessary. They should be started in a moist atmosphere and about seventy degrees of heat. Watering must be plentiful, and the plants require all the sunlight that can be had so early in the season. The beautiful flowers soon develop, in advance of the leaves. After flowering, the young shoots are trimmed back to a couple of eyes, which will develop strong flowering shoots for the following year. In the mean time, the leathery, glossy leaves make the plants quite ornamental without flowers. *Erythrina corallodendron* is the chief species treated in this manner. *E. Indica* is an evergreen tree chiefly grown in botanical gardens. The variety *Parcellii* has variegated foliage and is very ornamental. These are grown on without interruption the whole year.

All Erythrinæ require rich soil, an abundance of water during the growing season and a warm, sunny position. They are propagated by means of herbaceous cuttings, which are taken with a heel and rooted in bottom-heat.

The best varieties for outdoor use, besides *Erythrina herbacea*, are *E. Crista-galli* and *E. Bidwillii*, an intermediate form. For conservatory use, *E. corallodendron*, *E. Humei* and *E. Indica Parcellii* can be recommended. The whole genus is strikingly beautiful and deserves to be represented in every garden.

Short Hills, N. J.

N. J. Rose.

Notes on Bedding Plants.

THIS is a good time to make an estimate of the value of certain plants for bedding—a judgment which will be found useful when future plans are to be considered.

The improved Cannas have, no doubt, been largely instrumental in the brighter appearance of many gardens, and the improvement of these plants still continues in some directions at least. The flowers of several of the later varieties are larger and of better form than those of their predecessors, although the foliage of many is scarcely equal to that of some of the varieties of fifteen or more years ago. Prominent among the newer Cannas are Queen Charlotte and Columbia, the former of the Madame Crozy type, though with a wider edging of yellow to the petals, and the latter of a richer and brighter color than Alphonse Bouvier, and also more dwarf in habit. Both these varieties seem to be good growers and bear an abundance of large flowers in trusses, which continue in good condition for a long time. Several new varieties in the style of Captain Suzzoni and Florence Vaughan—that is, having yellow flowers, more or less marked with red—are also promising.

Strobilanthes Dyerianus seems to endure the full sunshine well and keeps in fairly good color. The purplish sheen of its foliage is valuable as a contrast with other plants, though the habit of the plant is somewhat weedy when compared with *Acalypha*.

In the Croton-beds some of the richest colors are found just now in the following varieties: Queen Victoria, Dayspring, Hillianum, Evansianum, Veitchii and pictum; but many others may be equally gorgeous during the coming month.

Begonia Vernon is useful either in sunny or in shaded locations, though I think the contrast between its flowers and foliage is more pleasing when the plants are in partial shade, for, under such conditions, the leaves are less bronzy and the flowers are larger.

The new silver-leaved Geranium, known as Mrs. Parker, is a plant of much promise, and will probably be extensively planted hereafter. Its variegation seems as good as that of the famous old Mountain of Snow, but the plant is more dwarf, stands the sun admirably, and has the additional advantage of bearing on short stems very compact trusses of bright pink double flowers.

Torrenia Fournieri makes a good plant for a partly shaded border, giving an abundance of bright flowers from June until frost, but, being an annual, it is useless to go to the trouble of taking cuttings in the fall, as one may do with *T. Asiatica*, for either of these can be readily raised from seed sown in early spring in a warm house.

Salvia patens is particularly effective in a mixed border with its abundant and graceful spikes of bright blue flowers at a time when flowers of this color are not overplentiful.

W. H. Taplin.

Cauliflower for Winter.

IF a supply of this vegetable is wanted about the holiday season the seed should be sown no later than the first week in September. We prefer to sow it in flats and prick the seedlings out, either singly in three-inch pots, or into flats again about three inches apart. Some sow the seeds thinly in cold frames and transplant into the benches when large enough; either way will answer, provided the plants have plenty of room, with sufficient light and air to prevent them from becoming drawn.

A forcing pit, with the benches two to three feet from the glass and where a night temperature of fifty-five degrees can be maintained, will be found a suitable place to mature the crop. The soil, good sod earth, with a fair dash of well-rotted manure, should be got together a few months before it is required for use, and turned over at least twice, and a sprinkling of lime worked through it at the last turning to discourage worms and insects. The benches should be deep enough to allow one inch of drainage and five of soil. The latter should be packed moderately firm when the plants are put in. Water should be applied sparingly at first, and only around the plants, until the roots have taken good hold of the soil, after which a more plentiful supply can be given; but

overwatering must be carefully guarded against, as the plants are sure to become inactive if the soil is allowed to become in any way soured. Air should be admitted both at top and bottom on all favorable occasions so as to maintain a day temperature of about seventy degrees, and the atmosphere of the house should be kept moderately dry, especially when the heads are nearing maturity. Aphides are the most troublesome enemies, but they can be kept in check by having a few tobacco stems spread over the surface of the soil. It is a good plan to make a successional sowing of seeds about six weeks after the first and have them in pots so they can be planted in where the others are taken out, thus keeping up a supply for several weeks from the same bed. This later crop will need to be strengthened by occasional applications of liquid-manure.

As to varieties, we have seen nothing to surpass Henderson's Early Snowball, which produces good-sized, well-formed heads, is excellent in color and flavor, and of a dwarf, compact habit. From a desire to make the greatest possible use of the space at command one is often tempted to plant a little too close, but crowding is always injurious, and we consider fourteen inches each way quite close enough to mature good-sized heads.

Tarrytown, N. Y.

William Scott.

Rosa rugosa.—I never saw this shrub fruit so freely as it has been doing this year, and its bright scarlet hips clustered thickly among the shining dark green leaves make the plant just now as beautiful an object as when it is covered with flowers in June. In the groups of shrubbery by seaside cottages and hotels it seems to be especially useful, and it endures the salt winds with the utmost cheerfulness. In large parks and gardens, where it can be left to itself, it sometimes reaches a height of eight or ten feet, and it is then most picturesque and effective, but it is rather more floriferous when kept dwarf by annual pruning. Altogether, this is one of the very best of the shrubs which have come to us from Japan.

Madison, N. J.

N. R.

Correspondence.

Peach-growing in Nebraska.

To the Editor of GARDEN AND FOREST:

Sir,—Nebraska is not in the Peach belt, and cannot be considered a peach-growing state; yet, perhaps, it can furnish as good an example of success in this line as many other states apparently much more favorably situated. One of the leading features of the summer meeting of the State Horticultural Society this year was a visit to the orchards of J. M. Russell & Son, who have about 150 acres devoted to this fruit near Wymore, in the south-eastern part of the state, close to the Kansas line. This is a favorable location both as to general climate and also because the land here is quite rolling and the advantage of a higher elevation can be secured. It is equally true that there are hundreds of other farms in the state quite as well adapted to the growth of peaches, and success in this instance only serves to demonstrate what can be done by studious, systematic attention to one given line of work. Messrs. Russell & Son occupy the position of pioneers in this industry, and, like Hale Brothers, of Connecticut, have shown the possibilities of their own region. Their planting began in 1880, and has gradually increased till the present time. Their first crop was harvested in 1887, but consisted of only 140 bushels. The trees were old enough to bear four years earlier, but had been killed by hard winters, so that the beginning of the undertaking was not altogether promising. From that time forward, however, they have secured a crop every other year, the largest one being in 1891, when they harvested a little over 6,000 bushels. The present crop, though good, is not a heavy one. Much of their work has been of necessity experimental, as there were no precedents for guidance, and the early results were not as good as they can confidently expect the future ones to be with their present knowledge. Many of the varieties planted proved wholly unsatisfactory in this climate, even though they give the best of satisfaction in other places.

As a first early variety, Alexander has proved the most profitable. It is too perishable and ripens too unevenly to ship well, but for the home-market it is excellent. Following this come Hale's Early and Early Rivers, the latter a large white peach, not equal to some others in quality and appearance, but the fruit is of good flavor and the tree is a reliable bearer. Hale's Early is more satisfactory here than in many sections of the east, because in this dry climate there is little difficulty

from the fruit-rot. This is one of the worst varieties to rot whenever that disease is present. Coolidge's Favorite is one of the best of the free-stones. It increases in size rapidly just at the ripening period. Hill's Chili is another most reliable kind. When asked to recommend one variety likely to succeed over the widest area and under the most varying conditions, Mr. Russell named the Wright, but he adds that it is late and rather poor in quality. This is a seedling obtained from W. F. Wright, of Johnson County, Nebraska. It comes true to name from the seed in nearly every case. Many well-known varieties, such as Crawford and Mixon, though hardy in wood, are tender in bud and prove a failure in this climate. The firm is testing a number of seedlings, some of which are very promising. One of these, known as Russell's No. 1, is the first free-stone to ripen. It is a seedling of Hill's Chili, grown next to Alexander. It closely resembles Alexander, but ripens about four weeks later.

The orchards receive the best of cultivation up to the middle of August. Not a weed is to be seen anywhere. The method of training would very likely be the first thing to attract the attention of an eastern grower. The trees are allowed to branch right at the ground, and are headed back moderately at the annual pruning, so that they are not over twelve or fifteen feet high, and in most cases the lower limbs lie directly on the ground, or at least partially rest on it. This thoroughly protects the trunk of the tree or does away with it altogether, and no serious injury comes to these limbs in cultivation, as a casual observer would expect.

The fruit is marketed in ten-pound grape baskets with raised covers, and at the time of the visit—July 25—it was retailing at fifty cents a basket.

Agricultural College, Lincoln, Neb.

Fred W. Card.

Plant-breeding.

To the Editor of GARDEN AND FOREST :

Sir,—Opinions may differ as to the best work for the experiment stations, and while having the utmost admiration and respect for Professor Bailey's horticultural views, yet his reply to Professor Goff's plea for more attention to plant-breeding by the stations (see page 318 of your current volume) should not go unchallenged. My claim is that there is fully as much scientific exactness required in breeding plants as in breeding animals, and that the analogy between the two is not superficial.

Professor Bailey's failure to succeed in the combination and fixation of the characters of Squashes, Gourds and Tomatoes, so that they will continue to reproduce themselves from seed, is no criterion for the production of new varieties in perennial species; for these, when produced by intelligent combining and selecting, can be multiplied practically without further variation. The tendency in all plants is to vary when placed under new and strange conditions. The best results of these variations, when selected and combined in one individual plant—which is readily accomplished in most cases—may prove of inestimable value; and in the perennial we have the transcendent advantage that the improved variety may be multiplied by division a million times, each part retaining the unimpaired qualities of the original.

It may be true that our eyes are dazzled by the reports of creations in plants "through the foresight of the operator," and that "time will discover the merits of all pretensions," but does any one believe that the Munson Grapes, the Carman and Dawson Roses, the various hybrid Orchids and a thousand other new flowers and fruits were produced in any other way except by "the foresight of the operator," just as truly as in the case of any mechanical or chemical combination? True, most of the processes of Nature are slow, quiet and unobtrusive, but not necessarily so. An intelligent combination of several forces in one useful direction will often produce immediate results which never could have been obtained otherwise.

A kernel of corn—if the right variety has been selected—when placed under the proper conditions of heat and agitation, is not very slow to unfold into a greatly changed product. Unless, however, we have some knowledge of the proper combinations, the desired result would be very uncertain; exactly the same rules apply to the creation of new forms throughout the vegetable kingdom. Not only can distinct varieties of superlative value be produced "by the foresight of the operator," but, as I believe, distinct and permanent new species which will reproduce themselves from seed, generation after generation, with as little variation as is the case with original wild ones.* A careful study of the matter, combined

* For a more complete elucidation of the subject, see paper on "New Fruits and Flowers," read at the last meeting of the American Pomological Society.

with field practice, will convince the operator that there are fixed laws in the breeding of plants as in other natural forces, and that the more we learn of these laws the more certainly we can control results.

Santa Rosa, Calif.

Luther Burbank.

Plant-breeding Once More.

To the Editor of GARDEN AND FOREST :

Sir,—Professor Bailey, in some comments on an article of mine (page 318), says that "man does not have it in his power to summarily produce a new variety with any degree of certainty." In dealing with wild plants in which we have no well-marked varieties to begin with it is true that we must wait patiently for chance variations; but in plants of which we already have more or less distinct varieties, I believe it is possible, by making use of the same kind of tact employed by the breeders of animals, to produce varieties possessing special qualities. I have done this in two instances myself. In both cases I had a definite idea at the outset of what I desired to accomplish, and though the immediate results of the crosses made were far from what I aimed at, continued planting and selection through several years have developed the varieties I sought with as much of fixity as the average vegetable variety possesses.

It seems to me that Professor Bailey's plea, "we must make more of the varieties we have," is really a plea for more plant-breeding. Of course, we ought to develop and improve the varieties we already have, but if we "make the most" of them we must also form new combinations of desirable qualities through cross-fertilization. It is my conviction that some of our experiment station workers can do much better service for horticulture in this line than in the simple testing of the varieties already in our catalogues.

Experiment Station, Madison, Wis.

E. S. Goff.

Recent Publications.

Wayside and Woodland Blossoms. By Edward Step. Frederick Warne & Co., London and New York.

This is a pocket guide to British wild flowers, constructed somewhat on the plan of Mrs. Dana's popular manual. It contains descriptions of about four hundred species, and colored figures of one hundred and seventy-five species. Neither drawing nor coloring is in the highest style of art, but the pictures will certainly serve to identify the plants described, and the text is rather more accurate, and contains less irrelevant matter than that of many books of this kind which have been published on this side of the water. Americans with little knowledge of botany will probably find this a helpful guide when they wander through the mother country if they wish to know the names of the wild flowers they encounter. They may be surprised to find that many flowers with which they are familiar at home, such as the Marsh Marigold, the Wood Sorrel and the Harebell, are figured in this little book as inhabitants of Great Britain also, and it ought to interest them to know that many of our commonest weeds, such as Shepherd's Purse, Chickweed, Ox-eye Daisy and Bittersweet, which are also figured among British wild flowers, are not natives of America, but emigrants from Europe.

Notes.

Mr. William Scott, of Buffalo, was elected President of the Society of American Florists at its late meeting in Pittsburg last week.

All the blossoms dropped from the trees of Osbeck's Sumach, *Rhus semialata*, var. *Osbeckii*, hereabouts ten days or a fortnight ago, but many of the *Sophora* trees in Central Park are still covered with flowers, although they came into bloom before the Sumachs did. This long season of flowering is a strong point in favor of the *Sophora*.

Mr. J. H. Hale writes to the *Fruit Trade Journal* that there are more than half a million fruiting Peach-trees in Connecticut this year, and since this has been a favorable season for northern orchards the output in that state will reach three-quarters of a million baskets of fancy fruit, and one-third of this is enough to supply the local demand. A few peaches of the Mountain Rose variety are now ready for market. Early Crawfords are just ripening, but the great bulk of Oldmixon,

Late Crawfords, Stump and the like will be at their best in Connecticut during the first half of September.

A good many of the hardy Speedwells have little ornamental value, but, as the season of its flowering has come around, we once more call attention to *Veronica longifolia*, var. *subsessilis*, which is altogether the most showy of the herbaceous kinds and one of the best of summer flowers. It is more compact and robust than the species and surpasses it in the color of its flowers. It grows two or more feet high, is bushy, and bears bright amethyst-blue flowers in terminal and axillary spikes six or eight inches long. Like other Veronicas, this plant enjoys a warm and sunny place and rich soil. Even in small gardens, where there is room for only the best plants, a space should be kept for this *Veronica*.

The Trumpet-weed or Joe Pye-weed (*Eupatorium purpureum*) is one of those sturdy composites which make an important feature in our late summer scenery along water borders and in moist woodland glades. Under favorable conditions it grows ten feet high or more, with a compound corymb of flowers often two feet long and almost as thick through. These immense heads, with their purplish scales and flesh-colored flowers on the tall stems, several of which grow from a single root so as to form large masses, make altogether an impressive picture. Although so large, this can hardly be called a coarse plant, as it is pleasing in appearance even when examined close at hand.

A law has been enacted in Michigan which compels the owners of fruit-trees and vines to spray them with appropriate insecticides and fungicides under penalty of a fine not exceeding fifty dollars, or imprisonment not to exceed sixty days, or both. The evident purpose of this law is to compel negligent farmers to do their full share in suppressing injurious insects and plant-diseases, a work which can only be done by coöperation. Three commissioners appointed by the selectmen of any township are authorized to notify farmers whenever insect or fungous pests are found in their orchards or vineyards, and if farmers fail to spray their trees or vines the commissioners are to do the work at the expense of the town, which can recover costs from the owner.

There is a law in Ohio which directs the superintendents of county or township roads to cut Thistles, Wild Parsnips, Bur-docks and other noxious weeds that are growing along the highways between the fifteenth and thirtieth days of June, the first and fifteenth days of August, and the fifteenth and thirtieth days of September each year. The experiment station of that state has recently sent out a bulletin for the especial use of road officers in order to secure information as to the condition of the borders of roads and railroads, and to ascertain to what extent the law is enforced which provides for the early and repeated cutting of noxious plants. Enactments of similar character have been passed in many of the states, but we never yet have seen such a law enforced over any considerable area.

All persons who care to inform themselves as to the amount of protection against injurious insects which is given to our fruit-trees by birds, ought to read the bulletin of Mr. E. H. Forbes, lately published by the Massachusetts Board of Agriculture. It is very plainly shown here that birds do a very useful work in destroying the eggs of many kinds of insects, and that the most dangerous pests of orchards, like canker-worms, bark-scale lice and tent caterpillars, are largely held in check by our common song birds, and that one of the best ways to secure a fruit crop is to encourage birds to live in our orchards. It is very evident that the winter birds which eat the eggs of insects ought always to be encouraged to inhabit our fruit orchards, and that the summer birds which feed upon larvæ are also of great value, and they should be protected and fostered until they become abundant.

The gardens of New Jersey and Long Island are now furnishing most of the vegetables that the markets of this city demand, and, owing to exceptionally favorable weather, the supply is so ample that buyers can usually get what they want at their own figures. A few choice products like well-grown Brussels sprouts command fancy prices, but a dozen bunches of the best new carrots sell for twenty-five cents at retail; extra cauliflower, from ten to twenty cents a head; Romaine lettuce, five cents a head, and Boston lettuce, fifty cents a dozen; egg-plants, five to ten cents each; red cabbage, ten cents a head; okra, thirty cents a hundred; Lima beans and green peas, sixty cents a peck; Hackensack melons, \$1.50 a dozen, and so on through the list. The fruit season is also at its height, and the markets and street stands never looked

more beautiful. California is sending late Crawford peaches, Heath Clings, Orange Clings and McDevitts, while high-grade red and yellow kinds are coming from Maryland, Delaware and New Jersey. The Hudson River vineyards are supplying Delaware, Niagara and Worden grapes. Virginia is still sending some fine Concords, and the Ives is already ripe in New Jersey. A few Damsons and Reine Claude plums are coming from western New York, but beautiful Bradshaws, Kelseys, Burbanks, Fellenbergs, Columbias and Coe's Late, from California, make the great bulk of plums now sold. Of the dozen kinds of apples in the market the highest prices are brought by Alexanders, followed in order by Duchess of Oldenburg and Gravensteins. Great numbers of pears are coming into the city, but prices for the better kinds rule high because many of them are going into cold storage.

The woodpeckers have been subjected to much adverse criticism by farmers and fruit-growers, and Professor Beal, assistant ornithologist of the Department of Agriculture, who has been studying them, has recently published a preliminary report on the food of these birds, from which it appears that some of the species, at least, destroy many injurious insects. From an examination of the stomachs of 679 of these birds of seven species it was found that three-quarters of the food of the downy woodpecker consists of insects, few of which are useful, while it eats practically no grain. The hairy woodpecker also eats a trifling amount of grain, but it eats many beetles and caterpillars. The flicker, more commonly called the high-holder in the middle states, is a great destroyer of ants, and, although it eats some fruit, a great proportion of this is wild berries. Altogether, it would be hard to find three other species among our common birds with fewer harmful qualities, and they should be protected in every way. Every farmer and landholder should especially try to preserve the flicker, which species is most liable to destruction. The red-headed woodpecker consumes more beetles in proportion than any of the others, but some of these are of the predaceous species, and this should be set down against the bird. It has a taste for corn, too, and for fruit. The red-bellied woodpecker does damage to oranges in certain localities in Florida, but eats quantities of ants and beetles. One bad trait of the yellow-bellied woodpecker is its fondness for the sap and inner bark of trees, but it is not probable that forest-trees are extensively injured; the bird, however, has a taste for Apple-trees, too, and it might do much harm to orchards. The pileated woodpecker is more exclusively a forest bird than any other, and its food is mainly of forest products, such as the larvæ of wood-boring beetles and the wild fruits. It is emphatically a conservator of the woods.

The Hale Orchard Company planted more than a hundred thousand Peach-trees on six hundred acres of land, near Fort Valley, Georgia, in the autumn of 1891 and the spring of 1892, and the resident superintendent, with thirty or forty negro assistants and sixteen mules, has kept the orchard thoroughly cultivated for three years. The early frost of 1894 destroyed the prospects of fruit at the first blossoming, and this year about fifty men were employed during April and May thinning out the surplus fruit. By the 20th of June three hundred and fifty hands and sixty mules were kept employed in picking, packing and moving four thousand crates every day. Owing to the destruction of the orange crop in Florida last winter, numbers of extra workers on fruits applied for labor, so that there was an abundance of the best kind of help. In the marketing season something like three hundred bushels of overripe, ill-shapen and scarred fruit are rejected every day, and the perfect peaches are graded by women and girls and packed in four-quart baskets, six of which fill a carrier. The crates when labeled are hauled to the railroad in spring wagons with canvas covering to protect them from dust and rain, and at the station they are loaded into refrigerator cars which hold from 525 to 600 crates each. The cost of picking, packing, freight, etc., amounts to \$500 a car, so that the eighty carloads of fruit sent north from this one orchard during the season cost for marketing \$40,000. Mr. J. H. Hale, who gives these figures in the *American Agriculturist*, says that the leading peach in that section is the Elberta, but extra-early sorts like Alexander are also largely grown. The first really good peach to ripen is the Tillotson, which comes on about the middle of June. After this the best peaches are St. John, Mountain Rose, Lady Ingold, Elberta, Belle of Georgia and Late Crawford, which rounds out the season about the first of August. The peach crop of Houston County alone gives employment to three thousand people, and all the roads leading to the railroad-stations are lined during the picking season every day with wagons of every sort hauling fruit to market.

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLE:—The Architectural Attack on Rural Parks.....	351
Why Certain Hickories Died. (With figure.)	Professor John B. Smith.
FOREIGN CORRESPONDENCE:—Notes on Orchids	W. Watson.
NEW OR LITTLE-KNOWN PLANTS:—The American White Birchies. (With figure.)	C. S. S.
PLANT NOTES.....	355
CULTURAL DEPARTMENT:—Carnation Notes	W. N. Craig.
The Garden in Late Summer.....	J. N. Gerard.
Rosa Wichuriana.....	G. W. Oliver.
The Faxon Squash	H. G. P.
Two Blue-flowered Annuals	G. W. O.
CORRESPONDENCE:—The Flower Garden at Wellesley.....	T. D. Hatfield.
Rhus Poisoning	D. P. Penhallow.
RECENT PUBLICATIONS.....	359
NOTES.....	360
ILLUSTRATIONS:—Section of bark of Hickory, showing galleries made by bores, Fig. 49.....	352
Betula populifolia \times papyrifera, Fig. 50.....	353

The Architectural Attack on Rural Parks.

THE dedication of the Battle Monument in Prospect Park, Brooklyn, last week, recalls a letter to the Park Commissioner of that city by Mr. Frederick Law Olmsted, the official landscape-architect of the Brooklyn parks. The views expressed are of such general importance that we quote a part of the letter:

We can hardly avoid the feeling that there is an unfortunate tendency to crowd Prospect Park too much with statues, monuments and other architectural structures, which are introduced more because they are interesting or desirable in themselves than because they make the landscapes of the park more beautiful or more natural and refreshing. It is difficult to object very strongly in any particular case, because the injury done to the landscape is not very great. It is not easy to make people understand why it is a disadvantage to the park to introduce interesting and, perhaps, handsome works of art, but you can readily see that if the tendency continues, and more and more monuments and architectural features are introduced, the time will come when the beautiful, quiet, rural landscape of the park will be to a great extent marred, and the park made to resemble a confused and fussy-looking garden, or the best of our rural cemeteries. Certainly it would seem to be a wise policy for a park commissioner to discourage, rather than encourage, the introduction into the landscapes of a beautiful rural or semi-rural park of such architectural and sculptural decorations. Appropriate sites could be found for any number of monuments in the public squares and small parks of the city, where they would appear to advantage, would enrich formal or garden-like grounds, and would not injure broad landscapes.

Mr. Olmsted goes on to state that an appreciation and love of the broad and simple landscapes of Prospect Park has been developed in the minds of intelligent citizens of Brooklyn, and many of them realize that, although bridges and roads and walks are necessary, they are, nevertheless, real intrusions on the scenery, and exist for the sole purpose of making the scenery available. Others who enjoy the landscapes have not analyzed their feelings to discover the foundation reasons for their delight in the park, and, therefore, their sensibilities are not shocked when it is proposed to introduce monuments or statues or architectural decorations which really detract from the beauty of the landscape. They make no protest because

they do not realize what destruction is threatened, and this is why Mr. Olmsted is absolutely correct when he states that his most important duty as professional adviser is to protect the landscape of the park from injury and encroachment.

As to the special case referred to, if the monument erected to commemorate the valor of the Maryland troops in the Battle of Long Island adds to the beauty of Outlook Hill, and if the surroundings of the monument add to its impressiveness, there can be no objection to its location. But since the ground on which it stands does not seem to be in any way identified with the part which the Maryland soldiers took in the battle, the site of the monument is not justified by any historical association. The argument, that the event celebrated was one of such importance that the charm of the most conspicuous portion of the park could justly be sacrificed to secure some worthy memorial of it, is utterly fallacious. No monument has a right to exist anywhere unless it is a creditable work of art, and the noblest work of art is misplaced if it is destructive of the natural beauty which the people have inherited. There is no essential conflict between the two, and any lesson of patriotism which the shaft is intended to teach could be delivered with greater force if it stood where it would harmonize with its surroundings.

But it is not any particular act or work which we wish to criticise, but rather to speak of the tendency against which Mr. Olmsted makes such strong protest. When Central Park was designed, some of the original commissioners insisted that a broad avenue should enter the park at the middle of its southern boundary and be carried straight through to the reservoir, and many of the newspapers advocated the scheme. The idea was to construct some festal gathering-place like a Spanish alameda, or a spacious formal promenade like those in southern Europe, where there can be no turf and where natural scenery is made subordinate to stately architectural effects. The projectors of this scheme were inspired by a feeling that the proper field for the recreation of a city population should be a place where urban art was intensified and aggrandized, and not a place where scenery of a rural or pastoral character prevailed; and there is a certain reasonableness in such an idea. A pastoral park is restful because it offers the direct antithesis of the conditions furnished by the rigid lines of city streets. But throngs of men and women in holiday mood and holiday attire on some spacious plaza—the recognized place for public greeting—is also a refreshing change from jostling crowds on business streets, where each man is absorbed in his daily work. But there is no excuse for any vacillating compromise between these two leading motives. We can conceive of a park in which the chief features are architectural, but we cannot impose such features upon a park naturally treated without detracting from their effectiveness and destroying the original charm of the place. And yet it is pretty evident that there is a school of artists in this country—artists, too, who are strenuous, and even fanatical, in their views—who have little appreciation of natural scenery, and who, therefore, feel disposed to transform all the city parks which have been planned with regard to their natural beauty into a field for architectural display. Some of these men are distinctly hostile to the motives upon which our pastoral parks have been designed, and they are constantly aiming to modify them on principles that are at war with those that prevailed when they were laid out. There are so-called architects who would even now be willing to take such a park as Franklin Park, in Boston, and Prospect Park, in Brooklyn, and transform them into meaningless incongruities—hybrids between what was originally aimed at and what a French architect early in this century would have essayed, introducing some sentimental passages to mimic nature, and making these mere interludes to effects like those produced at Versailles. These men, as we have said, are strong in conviction, confident, enthusiastic, and that they are able to accomplish much is seen by the ready-

ness with which commissioners who fall under their influence are induced to expend money for walls, balustrades, columns and statues, and how slow they are to spend even niggardly amounts to fertilize the soil or to improve the turf and trees.

It is to guard against such tendencies as this that the counsel of Mr. Olmsted should be taken to heart by every one who has charge of urban parks. A broad-minded artist in landscape understands the value of architectural features as well as the natural ones in public parks. He appreciates the fact that there may be cases and places where plazas of dignified architectural character are preferable to woods and meadows. Even in natural parks he recognizes the fact that there are situations where the artificial elements necessary for convenience should be emphasized and displayed. But behind and beneath all this is the strong and wholesome northern love of the elemental beauty of the natural world instead of the cockney or Parisian contempt for everything essentially rural. These architectural attacks upon rural parks spring from minds with a narrow range of artistic sympathies. The threatened danger does not come from art, but from bad art, and against this we must offer good art by precept and example. Sound art, high art, in our spacious city parks means essentially the development of every possible poetic charm in their natural scenery and the exclusion of every element which conflicts with this purpose.

Why Certain Hickories Died.

DURING July, 1894, Mr. J. D. Gallagher wrote me for remedies against certain borers that seemed to be killing Hickories on his grounds at Glen Ridge, a pretty little village near Newark, New Jersey, where there are many handsome trees along the roadsides and in the well-kept grounds bordering them. In reply to the letter I gave a little general information as to methods of treating infested trees, and hinted that it was not often possible to get satisfactory results in cases of this kind. In truth, I did not intend to encourage much hope of saving the trees, because I had seen so many similar cases, always brought to my attention when the doom of the patient was already sealed.

But Mr. Gallagher was persistent, and on July 30th he gave the history of the trees as follows :

In 1891 one of the most vigorous Hickories on my place, a tree twelve inches in diameter, showed a withering of the leaves, as if they had been stung by some insect. They did not all fall, however, and in 1892 the tree came out in full leaf and had apparently suffered no damage. In the spring of 1893 the tree came out in leaf again, and shortly afterward the leaves showed the old symptoms of 1891; but this time they all withered up and fell in midsummer. This year (1894) the tree put forth no leaves, although it is trying to throw out some sprouts near the ground. Last September another Hickory on my place, twenty feet from the first, a double tree, united close to the ground, showed in one of its halves a withering of the leaves, which fell off shortly afterward. The other half showed no symptoms of disease, but remained in full leaf, and the leaves fell in the natural course in the fall; this also was a large, strong, healthy tree. This spring the last-named tree and another standing beside it, which also had shown no signs of disease last year, failed to put forth leaves, except on some few branches, and these soon fell off. Standing near these trees is another tall, apparently healthy Hickory, about eight inches in diameter, which this spring put forth its leaves in the usual way, showing no signs of disease, but within the last ten days the leaves on its lower branches have begun to wither, and it is apparently dying. None of these trees to the eye had the slightest appearance of being sick until last fall, except the first one which I have mentioned. The loss of these fine trees in front of my door is a serious one to me for many reasons.

In response to this letter I visited the trees, and found matters much as Mr. Gallagher had stated them. The trunks of almost all the trees showed the somewhat oval holes due to the issuance of certain Buprestid beetles, and several specimens of *Dicerca divaricata* were captured

while parading up and down the trunk, apparently seeking good places to oviposit. Beneath the bark the flat-headed Buprestid larvæ themselves were found. A small number of round holes about three-sixteenths of an inch in diameter were found, and attributed to a species of long horned beetle, which I could not get at without an axe; or, possibly, the Pigeon Tremex may have been concerned in the work. Most numerous of all were the small round holes I had seen so often, and which I at once charged to *Scolytus 4-spinosus*, well known for just such injury. Except, possibly, the Longicorn (or Tremex), I considered the insects not as primary causes of the condition of the trees, but as results—that is, they took advantage of a weakened condition induced by other causes. And these causes were not far to seek. The trees were situated on a broad well-kept lawn sloping from the house to the street so as to secure rapid and perfect drainage, and so high that the deepest root-level must have been considerably above the street-level. The thick grass on the lawn made a perfect covering. For many years past this condition of affairs had existed; all the fallen leaves had been systematically gathered as soon as they dropped, and light top-dressings of manure had been applied each year—just enough to keep the grass in good condition. In other words, the trees rested in soil with only a small amount of moisture, and on the surface was an excellent trap which captured and assimilated every particle of plant-food, and at the most critical times absorbed every particle of moisture which fell upon it. Under such circumstances no tree could long maintain its vigor. My diagnosis was starvation, followed by borers; prognosis, extremely unfavorable. The only treatment that could be suggested was to stimulate the trees actively by an abundance of readily available plant-food. Trees frequently outgrow even severe injury, and it was only a question whether there remained a sufficient power of recuperation in the trees to enable them to take advantage of the help.

On this subject a letter from Mr. Gallagher, dated June 25th of this year, will prove instructive to your readers, although I can only give a brief abstract of it :

Under the infected trees I spread last summer 600 pounds of Mapes' fruit and vine manure, and washed it in with a hose and sprinkler. Result, a fine crop of grass, but no apparent effect on the trees. This spring 4,000 pounds of the same fertilizer were spread over my lawns, 1,000 pounds being put under the diseased trees. Result, an extra fine lawn, but no effect on the trees, and one tree dead that showed no signs of attack last year. On the first of June, none of the eight trees showing any signs of life, I had them all cut down and burned. I hoped that this heavy fertilizing had so strengthened the other Hickories that the pest would not overcome them, and they all looked strong this spring. The other day I found a tree behind my house dying at the top, and this, on examination, showed the holes of the borers. To-day I am having all the top limbs cut off this tree, and am having all Hickory-trees on the place dug around ten feet or more from the tree in each direction, and am putting fifty pounds of fertilizer around each tree on the raw earth and am washing it in with a sprinkler, giving the earth in each case all the water it will take, intending to repeat the watering every three or four days. I send specimens of beetles dug out of the limbs cut from the trees.

This was not particularly encouraging, but I was compelled to acknowledge that I could offer nothing more. It was not a question of keeping out borers; not a question of checking a threatened or recent attack, but rather a question of reviving trees that had given up the struggle and were yielding to the horde of pests lying in wait to finish the weak and dying. The beetles sent me were *Scolytus 4-spinosus*, and their injury (see fig. 49, page 353) consists in making between bark and wood a central vertical gallery one to one and a half inches in length, from which lateral galleries are made by the larvæ in all directions, so that the progeny from one pair of beetles may easily destroy the remaining vitality of an area three inches in diameter. No tree can survive for any length of time when generally infested by this insect. It bores in branches

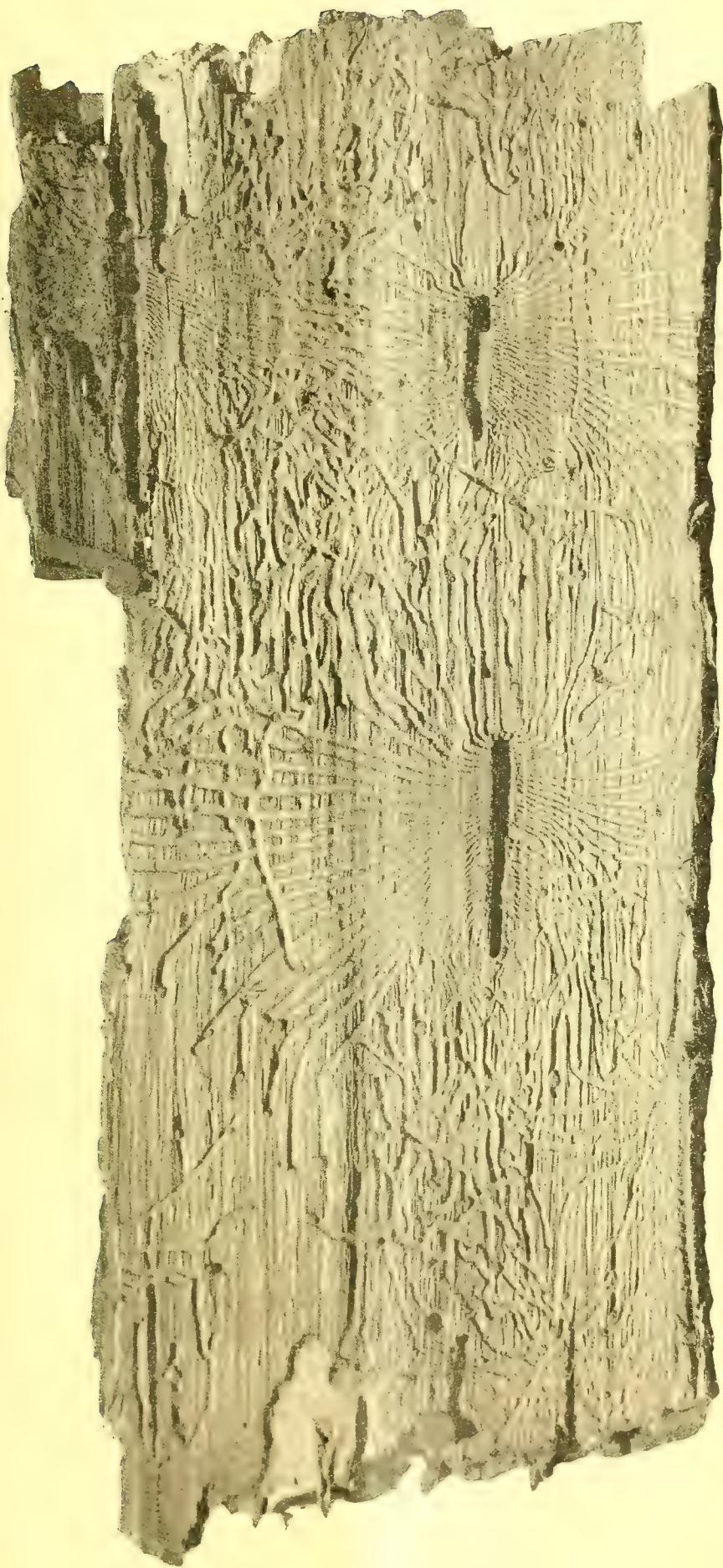


Fig. 49.—Section of bark of Hickory, showing galleries made by borers.—See page 352.

large and small as well as in the trunks, and for food, shelter, or in sheer wantonness, the beetle sometimes eats into twigs just below the growing shoots, causing the latter to wilt, wither and die.

The next letter, dated July 11th, was more encouraging in tone:

I have been carefully over the branches of the diseased tree that I am treating and cut out about twenty borers of the kind I sent you. Formerly my trees were first attacked low on the trunk and they died all over at once. The attack this spring has been solely on the upper branches, the result being that these branches only have lost their leaves. I argue from this that as the tree has been stimulated by rich fertilization, the trunk and larger branches have become strong enough to repel the attack. If this deduction has any foundation in fact, it is encouraging. I notice a much more luxuriant growth of foliage with deeper color, and the trees are, many of them, throwing out shoots on the trunk, which seems to me to indicate that they are gathering strength.

Besides soaking the upturned earth after it was fertilized, I have drenched the ground with the washings from my stable yard. I propose, about the first of August, to slightly disturb the surface again of these dug-up places and put on more fertilizer, thoroughly wash it in, and the first of September I propose to dig up around every tree, Hickories and others, and apply about two hundred pounds of bone meal, my idea being that the meal will slowly decompose and furnish fertilizer for the trees for some time to come. In addition to that shall top-dress my lawn early each spring.

In reply to this I indorsed the measures taken and proposed, and a note dated July 31st reports that no more trees seem to be affected. I have offered the record of this case, at this time, because it is by no means an uncommon one, and because instances of this kind are likely to increase rather than otherwise. It is too often forgotten that forest-trees on well-kept lawns are in an unnatural condition, and that their surroundings, so far as moisture and food-supply is concerned, are distinctly unfavorable, compared with the normal situations. Insects are thus given an advantage which they are not slow to seize upon, and though the trees make a gallant fight, of which they may show no traces for years, yet in some unusually dry or otherwise unfavorable year they become discouraged and suddenly give up.

The lesson is plain and should be heeded by those interested as owners of trees generally, for it applies not to Hickories alone. Borers in large trees are difficult to contend with, and when once a tree becomes generally infested we are helpless. But if we notice promptly a slight attack we can usually save the patient. In the first place make sure that a sufficient supply of food and moisture is provided, and then smear the trunk, at least to the large branches, with "insect lime" or "dendrolene." These are petroleum products which make a viscous coating of great lasting power, which no insect can penetrate and through which no eggs will be laid. The result will be the protection of the trunk from new attacks and the destruction of the insects then working in it, by preventing their issuance. The tree thus gets a new chance and will usually respond and repair damages.

New Brunswick, N. J.

John B. Smith.

Foreign Correspondence.

Notes on Orchids.

ODONTOGLOSSUM WATTIANUM.—Messrs. F. Sander & Co. exhibited a fine example of this plant at the last meeting of the Royal Horticultural Society, when it was awarded a first-class certificate. It was first described by Mr. Rolfe in 1890, when it flowered for the first time at St. Albans. Mr. Rolfe supposed it to be a natural hybrid between *Odon-*
toglossum luteo-purpureum and *O. Lindleyanum*, but it may with just as much reason be called a sport from the former, which it resembles in general characters, differing mainly in the shape of the lip, which is nearly two inches long, elongated, the margin fringed and the color creamy white, with a central blotch and numerous small spots of rose-purple; the petals and sepals are deep yellow, with bars and blotches of chocolate-brown. The plant shown bore a spike of fourteen fine flowers. Whether it be accepted as a species or a hybrid, or a variety, it is a handsome Orchid and fully deserved the distinction conferred upon it by the Royal Horticultural Society.

CATTELYA EROS.—This is a new hybrid of Veitchian origin, its parents being *Cattleya Walkeriana* and *C. Mossiae*, between which it is remarkably intermediate. A plant of it was exhibited last week and obtained a first-class certificate. The pseudo-bulbs are short and plump, and the flowers are as large as those of an ordinary *C. Mossiae*, and similar in color, except in the purplish maroon marking on the lip and the almost total absence of gold veins, so prominent a character in *C. Mossiae*. The lip also resembles *C. Walkeriana* in its spreading, almost flattened form.

CATTELYA FOWLERI.—A new hybrid raised by Messrs. F. Sander & Co. and named by Dr. Kranzlin in compliment to Mr. G. Gurney Fowler, who is now its owner, and who exhibited it last week, when it obtained a first-class certificate. It is the result of crossing *Cattleya Hardyana* with *C. Leopoldii*. In pseudo-bulbs and leaf it resembles *Laelia elegans*, while the flowers are as large as those of *C. Hardyana*, their color being mauve-purple, the broad wavy lip being intense violet-purple. It is a distinct and handsome addition to hybrid *Cattleyas*.

PHALÆNOPSIS LUDDE-VIOLACEA.—This is another addition to the hybrid *Phalaenopsis* raised by Messrs. J. Veitch & Sons, its parents, indicated by the name, being *P. Ludde-manniana* and *P. violacea*. It was shown last month at a meeting of the Royal Horticultural Society, who awarded it a first-class certificate. In habit and foliage it resembles the first-named species, while the flowers, although like that species in shape, are larger, and colored rose-purple, barred with a darker shade, the lip being yellow at the base, deep crimson in front, and more like that of *P. violacea*. It is not as attractive as some of the Veitchian hybrids in this genus, the best of which, so far, is that named F. L. Ames.

MICROSTYLIS MACROCHILA.—Some of the many species of this genus have a place among garden Orchids because of the pretty colors of their leaves. One of the best of them is *Microstylis Scottii*, a Malayan species, figured and described by Sir Joseph Hooker in *The Botanical Magazine*, t. 7268, but a better even than it is *M. macrochila*, which was introduced to Kew and elsewhere as *M. Scottii*, from which, however, it differs in having larger leaves colored yellow-brown, with a paler margin, and in its much larger flowers, and especially in its large, flat, red-purple, shining lip. It is easily grown in a tropical house.

DENDROBİUM BRACTEOSUM.—This is an attractive species, not large in flower, but exceptional in the distinctness of its colors. It is a native of New Guinea, whence it was introduced about five years ago, when it was called *Dendrobium chrysolabrum* by Mr. Rolfe in ignorance of the fact that Reichenbach had described it the year before under the above name. It has roundish pseudo-bulbs a foot long, leaves after the style of *D. Lowii*, and flowers in short crowded racemes produced from the nodes on the mature leafless pseudo-bulbs. There are about twenty

flowers in each raceme, and each flower consists of five equal lanceolate segments three-quarters of an inch long, and colored rosy mauve; the lip is small, erect, folded over the column at the base, and colored bright orange. A plant of it has been in flower at Kew for a month or more, and is still quite fresh. There are three racemes of flowers upon one of the pseudo-bulbs. It is more like some of the *Erias* than the general run of *Dendrobiums*.

DENDROBİUM PHALÆNOPSIS HOOLEUCA.—A pure white variety of *D. Phalaenopsis* was certificated under the above name at the last meeting of the Royal Horticultural Society, when a small plant bearing a four-flowered spike was shown by an amateur residing in Bath. It differs from the variety *alba* in having absolutely no color of any shade beyond a tinge of buff at the base of the column, whereas in *alba* the lip is lined with rose-purple. It is surprising how great a range of variation this species of *Dendrobium* has revealed, both in the size and form of its pseudo-bulbs and in the size and coloration of the flowers; in the latter there is every gradation from the purest white to the darkest maroon crimson.

DENDROBİUM CRUENTUM was described by Reichenbach in 1884 from a plant flowered by Messrs. Sander & Co., who have again recently imported it from the Malay peninsula. It is now in flower at Kew. The pseudo-bulbs and leaves resemble those of *D. Lowianum*, while the flowers are like those of *Cymbidium giganteum* in shape, but only about half the size; they are greenish-yellow, except the large reflexed lip, which is white with a wart-like crest and lines and spots of bright red. It is worth a place among the purely interesting, not showy, garden Orchids.

SOBRALIA LOWII.—A plant of this elegant little species is now in flower at Kew. It was first introduced about five years ago by Messrs. H. Low & Co., Clapton, and it has since become a favorite with growers of *Sobralias*. It belongs to the same group as *S. sessilis*, the stems being only about a foot long, clothed with elegant dark green recurved lanceolate leaves of rather leathery texture, and bearing flowers quite as large as those of *S. sessilis*, and colored uniform bright purple. It is a native of New Granada.

CYPRIPEDİUM MASSAIANUM SUPERBUM.—This is an improvement upon the hybrid raised by Messrs. Sander & Co. from *C. superciliare* and *C. Rothschildianum*, and named by them in 1893 *C. Massaianum* simply. The new form has larger flowers and is more attractive in color. It partakes much of the character of *C. Rothschildianum*, but the dorsal sepal is white and green with purple lines, and the petals are broad and hairy, while the lip is of a bronzy purple color. It was shown by Messrs. Sander & Co. last week, and obtained a first-class certificate.

VANDA CERULEA.—This is one of the most variable of Orchids in the size and shade of color of its flowers. One of the largest known is one which was shown at the last meeting of the Royal Horticultural Society by Mr. Gurney Fowler, and obtained a first-class certificate. It was a grand specimen, bearing four spikes and thirty-seven flowers, each of which measured four and a half inches in diameter, the color being an exceptionally clear azure-blue, with paler marbling, and the lip a rich violet-blue. The usual size of the flowers is about three inches in diameter. A peculiar character observable in this *Vanda* is the increase in the size of the flowers and change in the color which take place after they have opened; thus, a flower which on first expanding measured an inch and a half across and was colored lilac-rose, would, when finally developed, be three inches across and of a clear blue color, the purple hue being confined to the small lip. Although an old garden Orchid, this is still far from common in collections, as it does not always thrive under ordinary cultivation. It likes plenty of water, light and air in an intermediate house while growing, that is from February to October, its usual time of flowering.

New or Little-known Plants.

The American White Birches.

THE two American white-barked Birches, *Betula populifolia* and *Betula papyrifera*, are readily distinguished: the first by the viscid resinous glands which roughen its young branchlets, by its nearly triangular long-pointed leaves, broad and truncate, abruptly wedge-shaped or slightly obcordate at the base, dark green and lustrous, and roughened, especially early in the season, by small pale glands in the axils of the conspicuous reticulate veinlets on the upper surface, with few obscure primary veins and red petioles, by its usually solitary aments of staminate flowers, and short cylindrical short-stalked strobiles which are nearly upright and only about three-quarters of an inch in length, with puberulous scales; the second by its slightly viscid, but not gland-roughened branchlets, by its ovate acuminate short-pointed leaves, usually rounded or slightly cordate at the base, dull dark green and usually glandless on the upper surface, with numerous prominent primary veins and yellow petioles, by its clustered aments of staminate flowers and thick drooping strobiles usually an inch and a half long, with glabrous scales. *Betula populifolia* is a small tree, rarely more than thirty feet high, with dull chalky white bark, and is mostly confined to the Atlantic seaboard, where it ranges from Nova Scotia to Delaware, but extends through northern New England and New York to the shores of Lake Ontario. *Betula papyrifera* is usually seventy or eighty feet tall, although on the north-west coast it occasionally attains a height of one hundred and fifty feet, with lustrous bark slightly tinged with orange; it grows within the Arctic Circle and ranges from the shores of the Atlantic to those of the Pacific, and southward to Long Island, the mountains of northern Pennsylvania, central Michigan and Minnesota, northern Nebraska, Montana and north-western Washington.

In Plymouth and Warren, New Hampshire, and in Arlington, Massachusetts, the Messrs. Faxon have, at different times, found individual trees which vary in a greater or less degree from either of these two types and show, perhaps, what might be expected, that these species intercross. On page 356 of this issue, a branch of one of these trees found this summer by Mr. Walter Faxon at Arlington, is figured, as well as typical leaves of trees of the two White Birches growing with it. It will be seen that the leaves of this peculiar tree are nearly intermediate in shape between those of the two species: like the leaves of *Betula populifolia*, they are lustrous on the upper surface, their remote primary veins are rather more prominent than those of that tree, the petioles are only slightly flushed with red, and they are nearly glandless; the aments of staminate flowers are in pairs, and the strobiles, although rather smaller, resemble in shape and general appearance those of *Betula papyrifera*, while the scales are pubescent.

Betula papyrifera, as is natural with a species of such wide range, shows a greater tendency to variation than the other American Birches, and it is as possible that these peculiar trees represent one of its extreme forms as that they are natural hybrids. Their extreme rarity, however, and the fact that they are only found growing with individuals of the two species, certainly suggest hybrid origin—a view which is strengthened by the fact that other hybrids in this genus are known (see GARDEN AND FOREST, viii., 243).

C. S. S.

Plant Notes.

TILIA AMERICANA.—Our native Basswoods have been less frequently planted than some of the species of western Europe, and yet they are most desirable trees for streets and parks. In good soil they grow rapidly and attain large size; their foliage is abundant and rich, deep green in color; their flowers are delightfully fragrant, and much sought by bees, and they suffer less from insects

than the foreign kinds. A Washington correspondent writes that the trying weather of the past summer has also demonstrated the superiority of *Tilia Americana* over the European species for street shade-trees. While all have suffered more or less from the drought, the European species lost many of their leaves before the weather began to tell on the native one. Besides this, it was scarcely touched by caterpillars in that city, while the others have suffered very considerably. The southern species, *T. heterophylla*, is rather smaller, a graceful tree with a pyramidal head, with larger flowers than those of *T. Americana*, while its leaves, which are silvery white beneath, give it a singular beauty. It is perfectly hardy here.

HIBISCUS SYRIACUS.—The *Althaea*, or, as it is often called in England, the Shrubby Mallow, is an inhabitant of every old garden in the country, and owing to its formal appearance and the rather unpleasing blue-red color of the flowers of many varieties it is now somewhat despised. This is one of the plants which every one has learned how to prune in order to secure abundant flowers. These are produced late in the summer on the wood of the year, and, therefore, when the shrub is cut back hard in autumn or early spring it makes every effort to recover the loss by sending out a great number of new shoots which all bear flowers. After the plant has been pollarded for many years, and the root and trunk are strong, its appearance at this season is that of a bundle of long wands growing thickly from a stubby stem and covered with flowers. Of course, this treatment is proper if nothing but flowers are wanted, but if a judicious system of pruning is begun when the *Althaea* is young—that is, if the branches are simply thinned out and cut back moderately every year—it will develop into a broad round-headed small tree and make a very attractive specimen. The flowers of the different garden forms vary widely in color, and some of them are really beautiful, although, unfortunately, they have no fragrance. It is the best of shrubs for city yards, since it endures drought and dust and smoke, while few insects or diseases attack it, and its smooth dark foliage remains good till late in autumn.

ANANASSA SATIVA VARIEGATA.—While the ordinary Pineapple plant is not remarkable for its beauty, this variegated form takes a high rank among plants with striking foliage. The leaves are two or more feet long, spreading, canaliculate, with slightly spinate edges. Their color is green in the centre, edged with ivory-white and often suffused with bright orange or scarlet, or shades between the two. The white and scarlet in the leaves is generally clearly marked, and sometimes there are only faint lines of green in the centre. This variety will flower and fruit, just as the ordinary Pineapple does, at a height of about three feet. It will stand plenty of rough usage, extreme heat, drought and sunshine, without apparent injury. Its rosette of leaves is compact and regular, and few better plants can be found for a choice collection. It can be grown either in hanging-baskets or pots in a compost of equal parts fibrous peat, sphagnum and broken pieces of dry cow-manure. It will also do well in ordinary soil, provided the pots are well drained. It prefers a sunny position, and while an occasional drying is not injurious, moderate moisture at the roots is best. It should be sponged occasionally to keep it free from dust, but it is not under ordinary conditions subject to insect pests. Propagation by means of the young growth above the fruit is slow, but easy. Strong-growing plants can be topped to induce them to form several new growths, which in their turn may be taken off, potted in fibrous peat in small pots, and placed in bottom-heat, where they soon root. This is the best way of propagation. Ordinary summer heat is sufficient during all stages of growth, but a somewhat higher temperature facilitates propagation.

ARISTOLOCHIA ELEGANS.—This climber is well known to cultivators of greenhouse plants, and when ample root-room is provided it usually grows very thirstily. It has abundant twining stems and neat small, very slightly glau-

cous leaves, and bears in great abundance flowers of the quaintest beauty. The open corollas are varied with reddish brown tracery, and have a broad signal mark of the same color where the tube contracts. While usually grown

necessary to cut it down to a foot or more above the roots, which should be potted in the fall and stored in a moderately warm place, with slight supplies of moisture. The plant has none of the disagreeable odor which character-

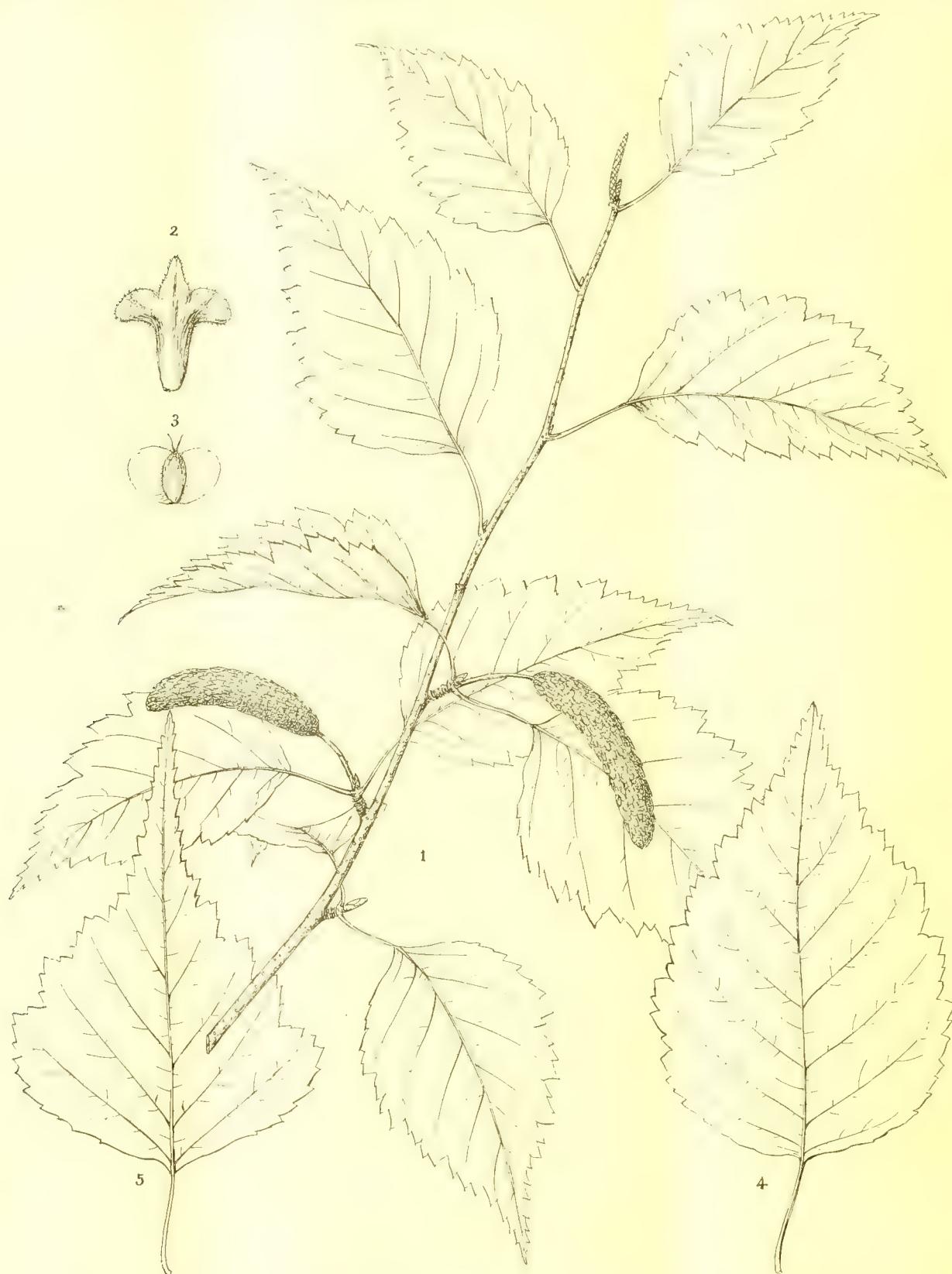


Fig. 50.—*Betula populifolia* × *papyrifera*.—See page 355.

1. A fruiting branch, natural size.

2. Scale of a strobile, enlarged.

3. A nut, enlarged.

4. A leaf of *Betula papyrifera*, natural size.

5. A leaf of *Betula populifolia*, natural size.

under glass, this is a very satisfactory vine in this latitude when planted in rich soil in the open border, and is well worth the attention of those who wish climbing plants of somewhat unusual character. To winter over it is only

lizes some members of the family. Its sprays are effective when cut, and the clean foliage adds to its usefulness in this direction.

GRAMMATOPHYLLUM SPECIOSUM.—The largest specimen of

this gigantic Orchid ever seen in Europe is in the Kew collection, where it has been three years, it having been presented by Messrs. F. Sander & Co., who imported it from Malaya, intending to exhibit it at the Chicago exhibition, but it arrived in too damaged a condition to send to America. It has recovered surprisingly since it came to Kew, where it is placed on a large tub in a corner of the Victoria regia tank, so that it obtains plenty of sunlight and moisture, both atmospheric and at the root. Mr. Watson writes that it has made new pseudo-bulbs over six feet in length and as thick as a man's wrist, clothed with ensiform leaves, nearly two feet long. In some parts of Asia its pseudo-bulbs grow to a length of ten feet and its enormous branched racemes are over seven feet long, clothed with fleshy flowers six inches in diameter and colored yellow with red-purple blotches. Plants of it have produced flowers in England, but only imperfectly, and a characteristic spike is yet to be seen in cultivation. Travelers describe wild specimens, which consist of a hundred or more pseudo-bulbs, forming a mass twelve feet in diameter and bearing about thirty spikes of flowers. It is epiphytic on very large trees.

Cultural Department.

Carnation Notes.

THE time for lifting Carnations has now arrived. We prefer to house our plants from the 5th to the 10th of September, waiting until the later date if the weather is very warm, as the plants suffer considerably if planting is followed by several hot days. Opinions differ as to whether the plants should be lifted with a ball of earth. One successful grower in this state always shakes every particle of earth away. Last year we tried a number of plants lifted each way; those with the earth attached wilted less and started into growth much better than the others. Where the soil is of a sandy nature, and shakes away readily, there is less liability of injury to the root-fibres than where it is heavy.

The distances the plants are to be set apart depends altogether on their size. Slender-growing sorts, like Lizzie McGowan, can be set much closer than robust kinds, such as F. Mangold and William Scott. The compost should be of a generous nature, as Carnations require more feeding than they usually receive. The plants should be pressed firmly in the ground with the hands and set sufficiently deep not to topple over. After planting, a thorough soaking of water should be given, and syringing attended to three times daily on all bright days. In a week's time all signs of wilting should have disappeared. The ventilators and doors should be left wide open night and day for some little time. When the plants are set out a light shading on the glass for a few days is beneficial. A little lime-water, applied with an ordinary syringe or force-pump, answers very well. It will not need to be washed off, as one or two heavy rains remove all traces of it.

Our plants, placed in the benches last September, are still (August 29th) loaded with flowers of fully as good quality as those borne in spring. We have fed them heavily all summer, using liquid-manure fully as strong as we give Chrysanthemums. These will be pulled out in a few days. After removing the old compost we wash the benches with crude petroleum and lime, and then refill and plant at once.

Among the new Carnations sent out last spring, the finest growth has been made by Bride of Eriescort, a white Canadian variety, which attracted considerable attention in Boston last February. Complaints are general that this variety is badly affected with rust, but we have not seen a trace on our plants, which have made the best growth of any sort we grow. Alaska, the late Mr. W. E. Chitty's new white introduction, also proves a fine grower. Bridesmaid has made very good plants, but Rose Queen looks rather small and sickly. The Stuart, a variety sent out last year by Mr. Dorner, has made the poorest growth of any kind here. The fine variety, Helen Keller, which grew indifferently and bloomed unsatisfactorily under glass, has made large plants in the open. We have not observed a vestige of rust on any plants. No diseased stock should be allowed inside a greenhouse. It is better to buy clean stock from a neighboring florist than to house plants which will probably never give satisfaction and be an eyesore all the season.

In many places benches now filled with Chrysanthemums

can be utilized for Carnations after the middle of November. A quantity of plants lifted and potted into five and six inch pots and held over in a frame can be used for this purpose. It is always well to pot up some of the surplus plants. They are useful to fill up blanks which may occur, and also for the greenhouse or conservatory. For pot plants the following sorts are excellent: Mrs. Fisher, William Scott, Hector, Winter Cheer and F. Mangold. As there is usually a scarcity of bench-room during the Chrysanthemum season, these plants can be carried over in a frame safely by taking proper precautions when cold nights come on.

Summer-flowering varieties in the open ground are still yielding an abundance of flowers and will continue to do so for some weeks. Last year we picked excellent flowers on November 5th. Dead flowers should be removed and the plants occasionally tied up. A sprinkling of chemical fertilizer and watering with liquid-manure will be appreciated, and the surface soil should be stirred constantly.

Taunton, Mass.

W. N. Craig.

The Garden in Late Summer.

MY garden just now seems to me less interesting than at any other time in the year, in spite of the fact that flowers are at this time very plentiful. What with the fierce August sun, which hardens up the foliage and at midday causes most flowers to flag, and brings a lassitude more suggestive of vacation ramblings than worrying the soil, the garden at this time lacks its usual inspirations. Fortunately, there is little attention or labor actually necessary now, and one may for pastime review some of his season's successes and failures and plan for a new season.

Among my earliest failures this year were the Calochorti. These flowered beautifully last year when planted in the open. In order to give them a severe test the bulbs were left in the ground, where they apparently survived, for they threw up good foliage early in the winter, which stood unscathed during some severe weather. Later on we had some extreme cold weather, with a temperature about zero for a week or more day and night, and this proved too much for the Calochortus-leaves, which were ruined. As they make very little foliage, this was fatal to their further progress, and no new foliage or flowers appeared. Calochortus-bulbs are perfectly hardy and very easily grown and flowered in the open, but they are safe only under certain conditions. The bulbs should be planted as late as possible, about the end of November here, and lifted soon after they have flowered. No covering is necessary here, though it is well to protect them from excessive moisture. They are not particular as to soil, though it is better not too heavy, and free from manure, of course. One cannot overdraw the beauty of these California flowers, especially the Venustus kinds. They are very charming and unique, and can be recommended without reserve to every one. Curiously, they are rarely seen in gardens, though the bulbs are cheap and readily obtainable.

Romneya Coulteri is another California plant which retrograded with me this year. Its new shoots scarcely made an appearance before May 1st, and these, instead of forming a growth some six feet in diameter, as they did last year, have made hardly a tithe of that amount, and flowers seem as far distant as ever. However, that the plant survived the rigors of last winter with trifling protection is great encouragement, as the main point is to find that it will live in the open. The flowers are, no doubt, as handsome in my anticipation as they will prove to be in reality when they arrive, if they ever do.

My Bamboos also made a new record this year; that is, their canes were cut to the ground by freezing weather for the first time in five years during which they have grown here. Usually they lose all their leaves, but new breaks are made in the spring on the old stems. My collection comprises *Bambusa palmata*, *B. aurea*, *B. viridi glaucescens*, *B. Simonii*, *B. Ragamossii* and *B. Quilioi*, which are certainly hardy here in roots and runners. Unfortunately, they are not planted in suitable earth and do not make great progress. To do their best they should have a rich, open moist soil, full of humus and a moist warm atmosphere. A plant of *B. Ragamossii*, a large, broad-leaved species, which was transferred to a tub in the greenhouse, makes more and better growth there than it has previously made out-of-doors in a season. Another broad-leaved species, *B. palmata*, may possibly be rather more hardy than the other species named, as it was the only one which retained any green leaves last winter. After having grown Bamboos so long, I am as yet quite undecided as to their merits. They cannot be said to be very striking plants, by which I mean they will not arrest the attention of a casual

observer, though they possess both grace of habit and distinctness of foliage. They make much litter in the garden, and it is quite late in the summer before they show their effectiveness. Whatever they may prove to be out-of-doors, they certainly make good decorative plants if grown under glass, where they are suited with conditions under which Palms thrive.

Crotons are plants which flourish in dampness and heat. They have been so much recommended for bedding lately that I plunged out a few plants to fill a bed which had been used for spring-flowering bulbs. In full sunshine they have grown well and made good foliage, but this has not become as highly colored as could be desired, and they would evidently be better in a hotter season. However, it is evident that they are desirable and effective plants in such a position. Their special drawback would be their care during winter, as they require storage in warmth such as can only be had in a greenhouse, while a tropical house would suit them better.

Cultural successes often depend on conditions which one fails to note in his rules. One of the friends who responded to my request for cultural notes for *Gloriosa superba*, kindly accompanied the note with a fine specimen of the tubers as produced by him. Evidently the tuber is the thing. With a strong root the culture is simplicity itself, and where formerly with small tubers I had no flowers, with the large ones, under the same conditions, this quaint Malabar Lily flowers as freely as can be desired, without any special conditions in the greenhouse fairly well ventilated but rather moist usually. A collection of plants is well calculated to keep one thinking on cultural requisites. It often happens when one has concluded that he understands all about growing certain sorts which have heretofore come along as certainly as Pusley, these same plants refuse, for some occult reason, to prosper. At about the same time some other one, which has a reputation for confounding the most skillful growers, will start up and flower beautifully, and the perplexed gardener can only conclude that the plants do most of their own growing and owe very little to him.

Elizabeth, N. J.

J. N. Gerard.

Rosa Wichuraiana.—This creeping single-flowered white Rose, which has been so largely used about Boston for covering slopes, mounds and the like, is adapted to many other purposes. A two-year-old plant at the home of Mr. C. A. Dana, on Long Island, has been trained on an arch at least seven feet high. The plant was put in at one side of the arch only; it has already covered the woodwork all round with a dense growth, and the points of the growing shoots take root firmly on the opposite side as they reach the ground. It evidently flowers more profusely in this position than when allowed to trail along the ground. Some specimens of this Rose which I saw at Kew, planted on a sunny slope, did not appear to be making much headway; this was, perhaps, owing to the very dry weather they have experienced there recently. In the Botanic Garden here plants one year old from cuttings cover a space of about twenty square feet and flower very freely. This Rose should certainly have a trial in every garden. Cuttings of half-ripened wood from outdoor plants put in damp sand about this time in a shady spot, and covered with a few large panes of glass, will soon take root. In fact, it is one of the easiest of Roses to root.

Botanic Garden, Washington, D. C.

G. W. Oliver.

The Faxon Squash.—For two seasons we have been cultivating this variety, which is also known here as the Brazilian Squash, and find it for summer use superior to either the Summer Crookneck or Scallop Squash, and for winter of equally good quality with the Hubbard at its best. It is not large, but bears well, and is easily prepared for cooking on account of its soft skin. It is a good keeper, too. It may not behave everywhere as well as here, but with us it is a decided acquisition.

Fruitvale, Calif.

H. G. P.

Two Blue-flowered Annuals.—*Browallia speciosa major* has flowers of much the same color as the well-known *B. elata*, although containing, perhaps, a trifle more of purple, but they are much larger and the plant makes one of the showiest annuals imaginable. To do it well the seed ought to be sown indoors and pricked off into boxes, so that when planting-out time arrives the seedlings will be in an advanced condition. *Lobelia heterophylla* resembles an upright-growing *L. erinus*, with few branches and flowers of the same color as that popular species, and about one and a half inches in diameter. If planted closely together the effect of these plants when in bloom is telling. Altogether, it is one of the prettiest blue-flowered annuals in cultivation.

Euphorbia hæmatodes.—This is one of the handsomest of the dark-foliaged plants for outdoor decoration. The leaves are almost round, dark claret-color above, paler beneath. During the summer it will grow to a height of about two feet. It is useful as a contrasting color to some of the variegated grasses, and is just what is needed for planting in situations where a good supply of water is not available, as it does not seem to suffer from drought in the least. In propagating from cuttings, as many of the leaves as possible should be left on the pieces, as they seem to give nourishment to the cutting until it sends forth one or two tiny roots; they should then be carefully taken from the sand and put, say, half a dozen round the edge of a five-inch pot, and shifted into three-inch pots as soon as they make a little growth.

Botanic Garden, Washington, D. C.

G. W. O.

Correspondence.

The Flower Garden at Wellesley.

To the Editor of GARDEN AND FOREST:

Sir,—A special feature of this garden, and one not usually found, is the use of many rare, and often valuable, plants. The garden is surrounded by a hedge, and facing one of the openings is a bed of mixed plants. Some of these are herbaceous and bloom early in the season, such as Delphiniums, Foxgloves and Canterbury Bells, the colors blending harmoniously, and they are most effective when seen in lines. A row of mixed Hollyhocks follows later, the season being wound up with a goodly variety of herbaceous Phloxes. The numerous interspaces are filled with summer-flowering plants—Celosias, Zinnias, Amaranths, Daturas, Cannas, Marigolds, Sunflowers, Antirrhinums, Petunias, Salvias and a host of other showy plants. Inside the path which circles the garden are a number of beds. Many contain commonplace plants, but always used with a true artist's knowledge of the proper blending of colors, for which Mr. Harris, the gardener, has a well-deserved reputation.

The "Tropical" bed is just now one mass of foliaged plants, relieved only, but quite effectively, by a few plants of Cleome pungens, a showy annual, which, although coming from the West Indies, has proved hardy here. The variety of plants used are Abutilons, Daturas, Eucalyptus, Castor-beans, Aloicas and Wigandias.

The Phormium bed probably could not be duplicated anywhere in the United States. *P. tenax* is the well-known New Zealand Flax. It has large coriaceous sword-like leaves nearly six feet long arising from a common root-stock in the same way as those of the common Iris. It belongs to the Lily family. Both known species are here represented. *P. tenax* is the strongest grower and the best known, attaining the height of six feet or more. *P. Cookianum* (*P. Colensoi*) is rarer in cultivation, and characterized by more or less drooping leaves with entire tips. The variegated form is here shown, which is said to make an elegant pot-plant. *P. tenax Veitchianum*, also a variegated form, is the dwarfest of all, not more than three feet tall; it is a very compact grower. The whole bed is appropriately edged with *Chlorophytum* (*Anthericum*) *elatum variegatum*.

The Grass bed is another interesting feature, and, if not the brightest, it is certainly one of the most attractive in the garden, not excepting the succulent bed. Here the giant among Grasses, *Arundo Donax*, looms up twelve feet tall. It is quite hardy, but the variegated form is not. The green, striped and barred forms of *Mischanthus Sinensis* (*Eulalia Japonica*) and also *Eulalia univittata*, var. *gracillima*, are all in pleasing contrast. *Papyrus Antiquorum* stands out in bold relief, and along the edge of the bed another dwarfer and more graceful kind of *Papyrus*, yet unnamed, *Panicum plicatum*, with, comparatively, broad deeply furrowed, recurving leaves, makes a very beautiful edging.

There is a remarkably healthy bed of Clothilde Souper Rose which endured the last winter successfully. This is the handsomest of all the Polyantha Roses, and nearly a perpetual bloomer.

A bed of Lantanas is worthy of note, if only on account of the age and size of many of the specimens. They are all trimmed into neat bushes. Some of the larger ones are nearly twenty years old, while many of the smaller ones, not more than eighteen inches high, are from eight to ten years old. The water-tank is an attraction which must not be omitted. It is a circular basin, with a vase on stilts, over which a small fountain plays. In the vase is a plant of the water Milfoil, *Myriophyllum proserpinacoides*, from Chili. Its long, gracefully drooping stems are clothed with finely divided verticil-

late leaves, having a very pretty effect. The basin is filled with plants of the Sacred Bean, *Nelumbium speciosum*. A semicircular tank on the outside of this is allotted to the water Hyacinth and the water Poppy. It is noteworthy that the *Papyrus Antiquorum* and also *Hedychium Gardnerianum*, which are recommended by dealers in aquatic plants, thrive much better in the open ground than they do as aquatics.

The unusually large number of tender evergreens is sure to cause remark. Here, perhaps, is the finest collection to be found anywhere on this side of the Atlantic; certainly, if the age and size of the plants is the main consideration. Few visitors realize the amount of care these plants require; and bearing in mind that all these shrubs have to be stored in cellars, or given winter protection under cover where the temperature does not go much below freezing point, it is surprising how rapidly they recover each year from removal and assume a home-like appearance. They are mostly trimmed or cut into shape, and most judiciously disposed throughout the garden.

Before giving in detail any account of the tender evergreens, there is one coniferous tree worth especial remark. This is the Parasol-tree of Japan, *Sciadopitys umbellata*. It is a perfect sugar-loaf in shape, about fifteen feet high, and has never been injured.

There are Japanese Spindle trees in endless variety, in all forms and degrees of variegation. Two of these weigh nearly half a ton each, and it is a considerable piece of work to move them indoors and out every year. *Osmanthus fragrans variegata* and *O. Aquifolium* are both handsome evergreens and very distinct-looking members of the Privet family. *Aucuba Japonica*, although very common in European gardens, where it is hardy, is seldom seen here. It is dioecious, and in order to have the pistillate plants well set with bright red berries, some staminate plants must be grown with them. It is difficult to do this where plants have to be pollinated under glass, but Mr. Harris has succeeded well, and has had some plants handsomely covered with berries. *Pittosporum Tobira* is a beautiful dark-leaved shrub. It is a favorite plant in the Paris flower-market, and largely grown for its very fragrant blossoms. *Ligustrum coriaceum*, with dark green, sinuated leaves, is a most singular-looking bush.

Palms are represented here by three large plants of *Chamærops Fortunei*, which, in winter, are stored in the cellar. The tallest of these is fifteen feet high and now covered with large bunches of ripe fruit.

English Hollies are well represented in many forms in degrees of variegation. These are among the most difficult shrubs to care for in winter, being very liable to lose their leaves, and often in an unaccountable manner. The roots do not hold soil well, and unless grown in tubs they are sure to come up in the autumn without any ball of earth.

T. D. Hatfield.

Wellesley, Mass.

Rhus Poisoning.

To the Editor of GARDEN AND FOREST:

Sir,—The various letters upon the influence of Poison Ivy, which have appeared in recent issues of your journal, have been read by me with more than ordinary interest in view of the somewhat extended personal experience which has fallen to my lot in this respect. As pointed out by Mr. Harrison, in your issue of July 3d, the poisonous principle is not peculiar to any one species of *Rhus*, but is more or less common to the entire family. Thus, in breaking open an old "Marking Nut," *Semicarpus anacardium*, I was subjected to the effects of the black, varnish-like latex found in the interior, which were those of our common *Rhus Toxicodendron*. My chief experience, however, has been with the Japanese lacquer as derived from *R. vernicifera*, the poisonous qualities of which are well known to Europeans, though many of the Japanese, notably those who gather and prepare the latex, as well as those who apply it to its various uses, are wholly exempt from its ill effects.

This most valuable of varnishes is not only applied to the manufacture of the many kinds of lacquered wares for which the Japanese are so well known, but it is employed for all those purposes for which we generally use other materials. It will, therefore, be understood that there are many occasions on which a susceptible European may receive the full effects of this extremely distressing poison before he is aware of its proximity. My first experience with the poison was when some material was brought to me for examination with a view to its employment in the manufacture of a particular kind of varnish. Not suspecting that so poisonous a substance as lacquer would be handed to me without warning, I stirred and smelt of it before asking what it was. The answer convinced

me that serious results were likely to follow, and when, two days later, I could scarcely see out of my swollen eyes, I found that my fears had been well founded. On a later occasion I was called upon to enter a building approaching completion, when I found the workmen using lacquer for the wood-work. Again serious results followed. During a residence of four years in Japan I suffered, in all about twelve or fifteen times, from the effects of this poison, but the first attack was by far the worst, and my final impression was that the system became gradually habituated to its action, so that the results were in each case less serious than on the previous occasion.

One very well-defined feature of its action was that after a few experiences it was always possible for me to ascertain whenever I came into an atmosphere charged with the poison, as in a close room. This was manifested by a well-defined, though not strong, acid taste in the mouth and a slight, somewhat acute, pain directly between the eyes. Both of these effects would disappear on regaining the fresh air, but they were invariable symptoms of the results to follow.

Notwithstanding the fact that the active principle is volatile, it sometimes displays a persistency beyond what might be expected. Thus, freshly made lacquer, as sold in the shops, is distinctly dangerous, as I have found to my cost, and the danger from this source does not disappear until the lacquer is several weeks old.

The only method of treatment with which I became familiar, as employed by the Japanese, is to take the flesh and juices of a fresh giant spider-crab, *Macrocheira Kæmpferi*, commonly sold in the markets for food, and apply freely to the irritated parts. The effect is gratefully soothing, but beyond this I am not aware that there is any specific action. The treatment eventually adopted was to make free applications of a solution of hyposulphite of soda, one-half ounce; glycerine, three ounces; carbolic acid, sixty drops, and water, ten ounces. This not only produces a very soothing effect, but appears to reduce the inflammation and hasten the drying-up process in a very marked degree. So efficacious has this treatment been that I have frequently made solutions for others, and its use has always been attended with excellent results.

Montreal.

D. P. Penhallow.

Recent Publications.

The Story of the Plants. By Grant Allen. New York: D. Appleton & Co.

This little book belongs to that useful series of which the *Story of the Stars* and the *Story of Primitive Man* have already appeared. The object of each one is to present the leading facts in some branch of knowledge in a clear, interesting way, and in language comprehensible to any reader of ordinary intelligence. This especial book is not popular in the sense of being superficial, nor does it treat mainly of what are generally considered the oddities and marvels of plant-life. On the whole, it is rather philosophical. Mr. Allen does aim primarily to make a picturesque story, but in the light of the latest botanical discoveries he sketches the history of vegetation on the earth from the simple primordial plant-forms of remote geological times down through the long history of the race to the immense diversity of plant-life as we now know it. Of course, such a sketch in a short two hundred pages must be a mere outline, and such an outline cannot connect the leading facts in so vast a subject as the evolution of plants in an orderly, continuous and consecutive way unless its author has a well-developed faculty for reiteration. It can truly be said that Mr. Allen has been singularly wise in choosing his topics, and that he has successfully accomplished what he set out to do, which, in his own language, is "to treat the history of plants much as one treats the history of a nation, beginning with their simple and unobtrusive origin and tracing them up through varying stages to their highest point of beauty and efficiency." The general theory of evolution has been adopted throughout and the plants are treated in accordance with the commonly accepted principles of heredity, variation, etc., so that the diverse ways in which plants have come to differ from the primitive pattern, their methods of eating, drinking, digesting, marrying and giving in marriage, producing and rearing their young, all fall into their proper places as related parts of one comprehensive plan or one continued story. The oft-

repeated tale of fertilization by insects and by wind was never more briefly or graphically told than in this little volume. Very clearly, too, in the chapter on Stems and Branches is it set forth how the different parts of the plant have developed, and how all these parts have been united together in so many ways to form a single organized community. In the chapter on Plant Biographies, which follows the separate consideration of the various elements of plant-life, some specimen lives of individual plants are taken up and traced through from the cradle to the grave with all their vicissitudes. Altogether, the book is an excellent one to put in the hands of any inquisitive young person. It will not discourage them by showing them how impossible is the task of discovering all that is to be learned in the structure and life of any one species, or even of a single tiny weed, but it will rather stimulate them to personal investigation, with the assurance that "even the little episodes in plant-life which they can pick out piecemeal are full of romance, of charm and of novelty."

Notes.

The large ripe yellow cucumbers that are occasionally seen in the markets at this season are used by German families, who make a mustard pickle of them. They cost only a cent or two apiece.

In a paper on Chrysanthemums read at the late Florists' Convention, Mr. E. G. Hill said that if he were limited absolutely to twelve varieties he would grow Vivian Morel, E. Dailedouze, Philadelphia, Mrs. H. Robinson, M. Richard Dean, George W. Childs, Ivory, H. L. Sunderbruch, H. W. Rieman, Niveum, Queen and R. McInnes.

Dr. William Albert Setchell, who is now Assistant Professor of Botany in the Sheffield Scientific School, has been selected to fill the chair of Botany in the University of California, which was made vacant by the resignation of Professor Greene. The people of California are to be congratulated on securing the services of a man who, while yet in early life, has won such an enviable position among the biologists of the country. Professor Setchell was elected a member of the Botanical Society of America last week.

One can hardly overestimate the value of our native Sunflowers at this season. Tall varieties, like *Helianthus oryzoides* and *H. Maximilliani*, bloom later in the season, but such species as *H. rigidus*, with its rich orange yellow flowers, and *H. mollis*, with a yellow disk as well as yellow rays and soft white woolly foliage, are both striking plants. The first of these when well established makes a shapely mass four to six feet high, while the other is smaller and so distinct that it is worth a place in any collection of perennials however select.

The prices of lemons are, perhaps, influenced more by the weather than those of any other fruit, and during the sweltering days of last week extraordinary figures were quoted. Majoris sold for as much as \$9.00 a box at the wholesale auctions, and choice Sicily lemons brought \$7.75. The difference in prices between lemons and oranges is most marked at this season, the best Rodi oranges now costing \$3.75. A car-load of California oranges sold here on August 30th averaged \$2.76 a box, wholesale, an unusually high price for this fruit so late in the season.

Every one is familiar with the Swamp Rose Mallow, so often seen in the salt marshes, where the delicate pink or white flowers have a singularly beautiful effect when surrounded by tall grasses. As we have often explained, this Rose Mallow, like many other plants which naturally seem to take to the water, thrive equally well in good garden-soil anywhere. Just now great masses of this *Hibiscus Moscheutos*, five or six feet high, are strikingly effective in the hardy-flower garden in Prospect Park, Brooklyn, even among our other stately autumn-flowering plants like the Silphiums and Sunflowers.

Professor Slingerland, of Cornell University, writes in the *Rural New Yorker* that tincture of Grindelia, diluted with three times its bulk of water, has been used successfully as a remedy for poison from *Rhus Toxicodendron*. This diluted tincture should be applied as soon as the irritation is felt and before the characteristic pustules appear. If used two or three times an hour at this stage of the poisoning the irritation will be checked and no pustules will be formed. If not applied until the pustules appear it will prevent the formation of new ones and

check the spread of the disease to other parts, and the pustules already formed will simply run their course.

Mr. J. Woodward Manning, in urging the planting of hardy herbaceous plants for florists' use, at the Pittsburg Convention, recommended as the best six white-flowering plants: *Achillea* (The Pearl), *Centaurea montana alba*, *Euphorbia corollata*, *Lathyrus latifolius*, *Pyrethrum uliginosum*, Double *Lychnis vespertina*; the best six yellow-flowering plants: *Buphthalmum salicifolium*, *Coreopsis lanceolata*, *Doronicum plantagineum*, var. *excelsum*, *Helenium Hoopesii*, the Double *Helianthus multiflorus*, *Hemerocallis Thunbergii*; the best six blue plants: *Campanula Carpathica*, *Delphinium Chinensis*, *Platycodon grandiflorum*, *Scabiosa Caucasica*, *Veronica amethystina*, *V. longifolia subsessilis*; and the best of pink or red: *Centaurea declinata*, *Heuchera sanguinea*, *Malva Alcea*, hybrid *Pyrethrums*, *Lychnis flos cuculi plenissima*, *Silene virginica*.

During the first six months of the current year more than ten million bunches of bananas have been sold in the United States, and since about sixty vessels are engaged in carrying this fruit to our markets, and from fifty to a hundred men are employed in unloading each cargo as it arrives, the banana business now probably takes rank as the leading branch in the fruit trade. The great increase in the consumption of bananas is due to the fact that the country fruit-stores can dispose of them more readily than that of other kinds of fruit on account of their cheapness, and many country merchants have built ripening-rooms for the fruit when received by them in a green state. According to the *Fruit Trade Journal*, the arrangements for receiving and discharging cargoes are more systematic in New Orleans than any other port of this country. The vessels there unload immediately on arrival at any time of day or night, and the railroads give special attention to shipments, so that the banana trains often leave New Orleans and make as good time as passenger trains to their destination. In 1891 New Orleans for the first time received more bananas than New York, but already in the first half of the year her imports exceeded those of New York by more than 800,000 bunches. Mobile ranks as the third port in the number of bunches received, while Philadelphia and Boston compete closely for the fourth place.

The extremely hot weather of the past week has hurried the ripening of Bartlett pears, and large quantities are now in the markets. The crop is unusually heavy this year, and much of it is being carried in cold storage. Large highly colored Bartletts are now coming from the Hudson River orchards, and these sell at a considerable advance over the cloudy colored pears from New Jersey. Fancy Bartletts command \$2.25 a barrel in the wholesale markets; Clapp's Favorite brings the same price, and choice Seckels sell for \$2.50. Lower grades of these sorts and of *Beurre d'Anjou*, *Buerre Clairgeau*, Sheldon, etc., are plentiful, and can be had as low as seventy-five cents and a dollar a barrel. Apples are even more abundant, and all but hard red varieties are selling at a disadvantage. Hand-picked Alexanders and Gravensteins sell for the highest price—\$2.00 a barrel. Peaches from Maryland, Delaware and New Jersey are of a good average quality, and the supply has not been excessive. Seventy-five cents to a dollar and a quarter a basket was the range of prices for really good fruit on Saturday. Delaware, Concord, Worden and Niagara grapes from western New York have now succeeded the southern product, and a five-pound basket of any of these varieties may be had for fifteen cents. The first Cape Cod cranberries are already here, and have sold by the barrel for \$6.50. The demand, however, is small and uncertain so early in the season. The Cape Cod crop is estimated to be twice as large as that of last year, and the New Jersey crop is also larger. California plums are offered in moderate enough quantity to maintain good prices, \$1.00 a box being the average wholesale price for good sorts. Among showy kinds are the delicately colored Silver prune, the golden Egg plum, the deep purple German prune, the very large deep red Gros prune and the small Hungarian plum, of a lighter shade. Peaches are considered above the usual quality, and prices are fair, considering the eastern competition. California Bartlett pears are in demand at high prices, notwithstanding the large local supply, and showy Seckels are also in favor at good prices. Among western coast grapes are Rose of Peru, with large round black berries, the yellow medium-sized Chasselas de Fontainebleau, Black Morocco, the popular Black Hamburg, the large broad-shouldered bunches tapering to a point. Tokay grapes of rich color sell for \$2.50 in double crates on the docks. Forty-four car-loads of California fruits were sold here in five days of last week against sixty-seven car-loads during the corresponding days of last year.

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TABLE OF CONTENTS.

EDITORIAL ARTICLES:—Unnatural Gardening.....	PAGE.
The English Oak. (With figure.).....	361
The Pines in a Dry Summer.....	362
Notes on some Arborescent Willows of North America.—I	Mrs. Mary Treat.....
Notes on some Arborescent Willows of North America.—II	M. S. Webb.....
FOREIGN CORRESPONDENCE:—London Letter	W. Goldring.....
PLANT NOTES.....	364
CULTURAL DEPARTMENT:—Notes on Hardy Perennial Plants.....	364
Cannas.....	R. Cameron, J. Woodward Manning.....
Notes from Cornell University.....	T. D. Hatfield.....
Isotoma longiflora, Caladium argyritis.....	G. Harold Powell.....
CORRESPONDENCE:—Origin of the Name Sambucus.....	G. W. Oliver.....
Rhus Poisoning.....	W. R. Gerard.....
The Sacred Lotus in Egypt.....	Professor T. J. Buryll.....
RECENT PUBLICATIONS	Anna Murray Vail.....
NOTES.....	369
ILLUSTRATION:—Oaks in Sherwood Forest, Fig. 51	370
	365

Unnatural Gardening.

WHEN Hamlet counseled, the players "to hold the mirror up to nature," he hardly meant that in their acting they should abandon themselves to unpremeditated impulse. The most natural acting is the most studied art. So a natural garden is not one given over to the spontaneous and uncontrolled growths of nature, but one in which a finished artist intensifies the effects that nature produces by emphasizing a feature here and there and eliminating every element that distracts from the central purpose of the scene. It is our belief that landscape-art reaches its highest development when it deals successfully with the fundamental and permanent features of scenery, and with a broad handling of a few simple elements presents typical pictures which are instinct with the poetry of nature. In sincere work of this sort there will be no labored attempt to conceal the hand of man. An affectation of mere rusticity would strike a jarring note like any other sham. Any landscape to be enjoyed as a work of art must have artificial elements, and the severest taste will never disapprove of good honest roads and walks with trim turf borders simply because they are non-natural. Indeed, the artificial construction may be so arranged as to heighten the charm of the picture and add to our appreciation of the creative genius of its designer.

Of course, there are other fields of garden art, and a catholic taste has no controversy with any true art. There are contracted spaces to which an ornate and strictly artificial style is adapted. There are architectural terraces and monumental buildings which need the lines of formal planting to supplement and complete them. Along a stately promenade like the Riverside Drive in this city, where the foreground is strictly defined by a parapet, there is an opportunity within this limit for statues and fountains and floral embellishment of the most sumptuous and elaborate kind, and this would serve as a fitting framework for the prospect across the broad river with the forest-crowned cliffs and the noble sky-line beyond. Many other places might be named where so-called decorative gardening and geometrical arrangements of flowering plants would be desirable, and wherever a real artist gives examples of his skill

in this direction he commands the gratitude of every one interested in garden art.

All this we have stated before so often and with such fullness of detail that it ought not to be necessary to repeat it. We believe that formal gardening is a legitimate form of art, but it does not follow that we approve of all formal gardens. A design conceived by an artist with a refined sense of color and form, and with constructive ingenuity, is one thing, but a pattern-bed, which is ugly in line and crude in color, is quite another. Every one has seen geometrical flower-beds of such elaborate pattern that they never can be properly executed with plants as materials. Even where they are not intrinsically bad—that is, where the figure is pleasing and the colors are not constantly at war with each other—they are often placed where they are out of harmony with the general design and with the special features about them. Wherever in a public garden the recognized canons of art are violated it is the province of a journal devoted to the subject to criticise such displays, and we have not hesitated to appeal to those in authority and who are, therefore, in a substantial way educators of the people, to furnish examples of gardening which will not offend the purest taste. But there are worse sins than those we have named, and there is no occasion here to characterize such efforts as the portraits of eminent men or the maps of different states wrought out on the turf with Houseleeks and Echeverias. Such subjects, with the imitations in color of flags and banners, badges and mottoes, are too trivial for serious consideration. They discredit the very name of garden art. Wherever used they can only disfigure our parks, and are accurately described as horticultural abominations.

Of course, shams of this sort cannot be spoken of with any toleration. They are on a level with the Weeping Willows made of human hair, which we sometimes see. There is no more excuse for permitting their use in a public park than there would be for decorating a city hall with the portrait of the Mayor done with little sea-shells. In regard to this spurious art we are led to explain our position once more because so intelligent a person as the editor of *The Independent* evidently conceives that our sole objection to it is based on the fact that "these floral pictures are not naturalistic," and on this assumption he argues that the same objection lies against every cultivated plant and gardening of all kinds. This statement is in the main true; but we have often argued that even in the natural treatment of a landscape there must be artificial elements which ought to be frankly used. We advocate formal gardening within proper restrictions, for the very reason that it is formal. When we protest against wall-paper designs it is not because they are unnatural, but because they violate artistic principles in form and color and location. We need not here repeat the specific exceptions we have taken against some of the displays in the Boston Public Garden and certain western city parks, but it ought to be stated that there are in our view serious objections to these works from economic and other points of view aside from the fact that many of them are puerile, others are discordant in color or whimsical in form, and nearly all of them are badly placed.

It is argued in favor of these flower-beds that "the taste of the common people approves them." No doubt, there are many persons among those whom the editor of *The Independent* classifies as "common people" who agree with him in admiring this so-called garden art. It is true, also, that there are many persons who take greater delight in the chromo-lithograph of a horse-race than in one of Rubens' canvases, and yet when a city government founds an art gallery for public enjoyment and instruction it does not fill it with chromos. There are people to whose ears the melody of Grandfather's Clock is more pleasing than the Tannhäuser Overture, but when a city furnishes music for the people its aim should be to furnish good music. When a public building or statue or monument is to be erected, the authorities are justly criticised if

they do not entrust the work to artists of the first rank. Boston has wisely engaged Mr. Olmsted to design her public parks. Why not consult an artist of equal rank to furnish some permanent scheme for treating her Public Garden? Men entrusted with the expenditure of the people's money should aim to improve the public taste, if it is bad, rather than pander to it.

We are by no means convinced, however, that a majority of the common people, whoever they may be, approve this kind of gardening. There is nothing more snobbish or vulgar than the notion that the best art is beyond the appreciation of the great bulk of the people. They like good architecture, good pictures, good music, and whenever they have the opportunity to admire a good garden they show their appreciation of it. When Boston was full of delegates to the Christian Endeavor Convention the Public Garden was thronged, as a matter of course, with strangers, who inspected with interest the reproduction of their emblems on the grass. It is probable that they would have had greater admiration for an honest effort at a genuine garden. Many of them have taken pains to assure us of this fact by letter, and one lady expressed her bitter disappointment at finding "floral fashions in Boston which would not be tolerated" in the Kansas town where her home is. Really, the bulk of our people despise shams and artifice more and more. No one now thinks of sending to a lady a heart constructed of white carnations and pierced with an arrow of crimson ones. Floral designs imitating fiddles and bells and pieces of furniture have given place to simpler arrangements of more harmonious color. The same change is coming in the treatment of our pleasure-grounds. The picture of four men of life-size rowing in a boat will not again be seen spread out in gaudy colors on the turf of any American park, and it is to be hoped that the famous American Eagle with a glass eye, and the Gates Ajar, constructed with bits of blue stone to furnish a detail when flowers of that color were not at hand, have both passed away forever.

The English Oak.

OF course there is a great diversity of size and habit in the fifty species of Oak which grow in the United States, and several of them rank among the most dignified and majestic of our native trees. The best of them require centuries of growth before they attain their noblest expression, so that it is true, as has been stated, that very few Americans have ever seen a White Oak in its full expansion grown to maturity in the open ground. The difference in character between what Gilpin styles "an insulated Oak which has developed without any lateral pressure" and one which has struggled sturdily upward among other trees in the forests is very marked. There are Live Oaks in the south which have had free chance to show what they can do when they had an opportunity to reach outward as well as upward, and we have already expressed the opinion that one of these trees at Drayton Manor, on the Ashley River, South Carolina, is the most massive, symmetrical and imposing tree in eastern North America. The common British or Royal Oak resembles our White Oak in habit of growth, and many of these trees are to be found in parks and open forests of England, where they have been undisturbed since the time of the Druids, and their sturdy trunks, wide-spreading branches and venerable age make them the most impressive features of the scenery, so that it is little wonder that they are regarded with a feeling akin to reverence. The illustration on page 365 shows a group of these trees, with the usual undergrowth of Ferns, in Sherwood Forest, which has been a royal hunting-ground from time immemorial, famed in romance as the home of Robin Hood, and noted for such historic trees as the Parliament Oak, the Major Oak, the Shire Oak and other celebrated specimens. These Oaks were quite as eminent for the soundness and quality of their timber as for their majestic appearance, and many of the best of them have been cut for use in public buildings. There

is still in existence an autograph letter of Sir Christopher Wren to the Duke of Newcastle, in which he acknowledges the grant of certain trees from this forest to be used for rebuilding St. Paul's Cathedral after the great fire in London: "Wee must accept," writes Sir Christopher, "this season but ten of the great trees, and I presume once more to acquaint you with the scantlings of the great Beames to prevent mistake, to wit: forty-seven feet long and thirteen by fourteen inches wide at the small end, growing timber, this scantling to hold die square as neer as can be without sap." When we remember the amount of oak timber that has been used for British navies and for other construction, it is a marvel that so many of the oldest and finest trees remain in this forest unscathed, except by time.

While the English Oak is one of the noblest of trees in its native land, like many other trees from across the Atlantic, it does not succeed as well here, so that both from an economical or an ornamental point of view it is not as well worth planting as many of our native species. The ordinary variety of the British Oak, *Quercus pedunculata*, is a variable tree, and it has been cultivated so long that numerous quite distinct forms have been established. There are forty-five of these varieties in Kew Gardens, and some of these, like the Pyramidal Oak, for example, seem to thrive better here than the type. Since the climate of our Pacific coast resembles that of England more closely than our own, it is not improbable that the British Oak may make itself at home there. Some experiments made by Professor Hilgard a few years ago seem to show that they are likely to endure the severe droughts of a California summer, and presumably they will find more favorable conditions in Oregon and Washington. If this is true, this Oak will make a valuable addition to the timber-trees of that region where hardwoods are rare.

The Pines in a Dry Summer.

THE intense heat and drought of the past two months has driven collectors and students of plants in the Pines to out-of-the-way nooks in damp places, while the usual quota of plants is found in the ponds and marshes. One of our best collectors of flowering plants, and of material for the microscope, is a Japanese who joined our class a year ago. But for his enthusiasm I fear our weekly meetings would languish for lack of analytic material.

Among the plants now in bloom is *Ludwigia alternifolia*; growing in swampy places, its bright yellow flowers in the upper axils appear all summer. The roundish seed-pods are filled with tiny seeds, which, when ripe, can be sprinkled from a round hole in the top, as from a miniature pepper-box. *L. hirtella* is like *L. alternifolia*, except that the seed-pods of this species are not wing-angled and the roots are tuberous. *Decodon verticillatus* is quite a handsome plant, growing sometimes in rather deep water, with wand-like stems from six to eight feet in length, and clusters of pinkish-purple flowers in the axils of the upper leaves. In company with these *Loosestrifes* we find both species of the nearly related Meadow Beauty, *Rhexia Virginica* and *R. Marianae*, in full bloom. There are so many attractive features about these plants that one never ceases to admire them. If we open the flower-bud we find eight long golden anthers inverted and closely packed around the pistil; as the flower expands they rise and take their places jauntily in a horizontal position on top of the filaments. The urn-shaped seed-pods, too, are ornamental, and the seeds are coiled like snail-shells. All the minor details, like the bristly hairs on the leaves and the small spur at the attachment of the anthers, are wonderfully attractive under a low power of the microscope.

Two or three species of *Hydrocotyle* are trailing along in the moist places. Some of the plants are growing in water along the edge of the pond, while others are on comparatively dry ground. The umbels of small white flowers are on long peduncles, and often these umbels are one above the other, sometimes to the number of three or four. *H. umbellata* has round shield-shaped leaves, and

when it grows on the drier ground its running root-stocks are tuber-bearing, while plants in wet places are free from tubers. The Button Snakeroot, *Eryngium Virginianum*, is another interesting plant among the Umbelliferæ; the flowers are of a dull bluish color in round dense heads. Another species, *E. yuccæfolium*, is also here. This species has long, thick parallel-veined leaves which look very much like those of *Yucca filamentosa*. The flowering stems are taller and stouter, and the heads of the flowers are larger than those of *E. Virginianum*.

The Cardinal-flower is still lighting up the damp Pines with its flaming red spikes of flowers, and the less conspicuous, but pretty, blue *Lobelia syphilitica* is near by. Everywhere the damp Pines are redolent with Clethra, the drought and great heat not having lessened the mass of bloom. Several species of *Polygala* are flowering now. The bright orange heads of *P. lutea* are conspicuous among the tall Grasses, and so are the dense red heads of *P. sanguinea*. The much-branched *P. fastigiata*, with paler flowers, is scattered among them. The Gerardias, too, are making a fine display at this time, especially the tall purple *Gerardia*, its wide-spreading branches laden with large rose-purple flowers, and *G. auriculata*, scarcely branched at all, but full of flowers all along the axils of the stout stem.

The handsome Monkey-flower, *Mimulus ringens*, with mirth-provoking face-like corolla, seems to peer at us out of hidden recesses, along with the pretty *Gratiola aurea*, which has bright golden flowers as an offset to the rich purple of the *Mimulus*. Several species of Dodder are interesting studies at this time, and one can hardly count the water plants now in flower: *Brasenia peltata*, with dull reddish-colored flowers; the handsome *Limnanthemum* and the various *Utricularias* and *Sagittarias* and *Eriocaulons*, and the curious *Valisneria spiralis*, as if endowed with knowledge, so as to send the staminate flowers, which blossom beneath the water, to meet the pistillate on the surface. In the drier places we find handsome twining wild Beans with rose-colored flowers; St. Andrew's Cross, with pale yellow blossoms, and several *Hypericum*s, with deeper yellow flowers. Asters and Golden-rods are telling us that autumn will soon be with us with its rich wealth of color.

Mary Treat.

Notes on some Arborescent Willows of North America.—I.

SALIX NIGRA, Marsh.—The western limit to the range of this species in the Mississippi Valley is not definitely known. It is reported as common in the eastern portions of the states of North and South Dakota, Nebraska, Kansas and the Indian Territory, while, on the other hand, it is not known to occur anywhere in the Rocky Mountain region; it has not been found in the Black Hills, and is replaced exclusively along the headwaters of the Platte by *Salix amygdaloïdes*. The limit will probably be found within, rather than west of, the boundaries of the states mentioned. From Louisiana it follows the Gulf coast westward, but has never been credited to Mexico. While the central plateau of the continent seems to present a barrier to the extension of *S. nigra* westward, a few stations at the extreme south may indicate a more or less continuous line of distribution from Texas to southern California and thence northward to the Sacramento Valley: Texas, Kerr County (Heller); southern Arizona, Fort Huachuca (Palmer, 452), and Tucson (Toumey); California, Clear Lake (Bolander) and Maryville Butes (Blankinship).*

SALIX NIGRA × AMYGDALOIDES, Glatfelter, *Trans. St. Louis Acad.*, vi.: 427 (Ap., 1894).—The easternmost stations

* Collections made by Mr. J. D. Smith in the mountains of Guatemala, and which I named *Salix Humboldiana*, I now believe might with greater propriety have been referred to *S. nigra*, var. *falcata*. But the region was so far within the recognized range of the former, and so far beyond the known limit of the latter, I thought it best to keep on the conservative side. *S. Humboldiana* is only a tropical modification of *S. nigra*, and it is to be expected that on intermediate ground when the two meet determinations as between one species or the other will be more or less arbitrary.

known for *Salix amygdaloïdes* are Ithaca, New York (Professor Dudley), and Montreal, Canada (Mr. J. G. Jack). There is, therefore, a wide area in New England occupied by *S. nigra* without the intrusion of *S. amygdaloïdes*. Beyond the western limits of the range of *S. nigra*, namely, in the Rocky Mountains, from Utah to British Columbia and in Oregon and Washington, *S. amygdaloïdes* is very common and exhibits no departure from the typical form. It is only where the ranges of these two species overlap, as they do in the Mississippi Valley, that we find the intermediate forms which have been so carefully studied by Dr. Glatfelter. Bentham says that "where two supposed species grow together, intermixed with numerous intermediates bearing good seed, and passing more or less gradually from one to the other, it may generally be concluded that the whole are mere varieties of one species." The *Nigra-amygdaloïdes* intermediates present all the conditions thus specified, but, nevertheless, they are hybrids and do connect two good species. In New England, with *amygdaloïdes* absent, we have unadulterated *nigra*; in the far west, with *nigra* absent, we have pure *amygdaloïdes*, and only where these two grow together do we find the interminable confusion of intermediates. No more decisive proof of their hybrid character could be found short of the final test of growing plants from seed obtained by artificial fertilization.

SALIX WARDI, n. sp. (*S. nigra*, Marsh., var. *Wardi*, Bebb, *Flora of Washington*, 114.)—To the full description of this Willow, as at first given, it seems almost needless to add a single word unless it be to emphasize the distinctions which warrant its separation from *Salix nigra*. The leaves are larger, usually broader, conspicuously glaucous and prominently nerved beneath. The stipules are large, persistent, and present with a degree of constancy noticeable even among Willows. In narrow-leaved forms of *S. nigra* "the leaves are of the same color on both surfaces, which are, by the twisting of the petiole, presented almost equally to the light" (Emerson). In *Wardi* the narrow-leaved forms are more intensely glaucous beneath than those with broader leaves. The aments are longer and more loosely flowered, terminating lateral branchlets, the growth of which is continued from the bud in the axil of the uppermost leaf. The capsules are larger, more globose-conical, under a lens minutely glandular and longer pediceled. The statement made when this Willow was first described that in some of its forms the leaves alone, with their ample stipules, might easily be mistaken for *S. cordata*, finds striking exemplification in Professor Short's specimen in the Gray herbarium, which two no less competent salicologists than Mr. Carey and Professor Andersson have mistaken for "*S. cordata angustata*." Indeed, it is apparent from the description that this identical specimen served as the type of *S. cordata angustata*, ^{1°} *forma discolor*, Andersson (DC., *Prod.*, xvi.², 252). No leaf of genuine *S. cordata angustata* would have suggested the comparison with *S. Bonplandiana*, which, as applied to *Wardi*, is not inapt.

SALIX OCCIDENTALIS, Koch, var. *longipes* (Andersson), *S. longipes*, Andersson, *Proc. Am. Acad.*, iv., 53. *S. nigra*, Marsh., var. *longipes*, Andersson, *Monog. Sal.*, 22, and DC., *Prod.*, xvi.², 201.—With the exception of transferring *longipes* from *Salix nigra* to *S. occidentalis* (Koch, *Commentatio*, 16 [1826]), which latter is clearly the type of this southern species of the Amygdalinæ, it is deemed best to leave all the forms grouped by Andersson under *S. longipes* mainly as they have been arranged by this acute salicologist. The material is not at hand for a thorough and satisfactory revision. Only one important change should be made, and that is to reduce *S. Wrightii*, Andersson, to a mere *forma monstrosa* of *longipes* *forma venulosa*. The short, densely flowered, thick, curved aments are simply the result of an abnormal contraction of the rachis. A like freak is sometimes observed in *S. discolor*. The characters drawn from the capsule, believed by the author to be distinctive, are common to allied forms, a fact which the paucity of Professor Andersson's material alone prevented him from perceiving. In various forms *S. occidentalis* occurs from

Florida westward to New Mexico, Arizona, the Sierra Nevada Mountains and adjacent portions of northern Mexico.*

SALIX BONPLANDIANA, HBK.—Found growing in a cañon near Tucson, at the base of the Santa Catalina Mountains, by Professors Sargent and Toumey, 1894, not before known to occur north of Mexico. Professor Toumey writes that it is "a frequent tree in the cañons and along the washes in the foot-hills throughout southern Arizona. The bark is dark gray and very rough, more so than that of *Salix nigra*. I see no reason why this Willow should not extend north as far as the great rim which separates the southern plains from the Colorado plateau. The leaves of the previous year do not fall until the flowers of the following spring are fully out." This habit of the aments appearing in the axils of the leaves of the preceding year's growth is one taken on more or less by all Willows which invade warm countries, but it is particularly noticeable in the case of *S. Bonplandiana*.

Rocky Mts., III.

J. S. Bebb.

Foreign Correspondence.

London Letter.

I HAVE just returned from visiting some of the great gardens of Scotland and have brought home with me memories of the delightful and distinct phases of plant-life that luxuriate in that cool and moist climate, and which we cannot attain to in the south. The most striking effects one sees on the great estates are those produced by the Chilian *Tropæolum speciosum*, which brightens the walls of almost every cottage with a mantle of intense vermillion blossoms, which are not infrequently intermingled with the yellow Canary creeper, a charming mixture. And all this beauty is obtained with little or no trouble, as the moist climate is exactly adapted to the plants; yet we in the south do all we can to coax the Chilian native into healthy growth, generally with but indifferent success. We sometimes succeed by planting it against a wall facing north, where, of course, it is always in shade; but it wants sun and a moist cool atmosphere. This is one of the most attractive plants in Scotch gardens in August, but a host of others that like similar conditions help to make the gardens gay. Violas especially flourish to perfection, and marvelous collections, as those in Forbes' nursery garden at Harwich, produce color-effects that few other plants are capable of. Roses are flowering as luxuriantly now in the north as with us in the middle of July, and many of the open air plants that here are past before August sets in are in perfection there now. It is thus easier to obtain the best color-effects in August and September in the north than it is in the south.

To relieve the monotony of the shrub-border during the flowerless period is no easy matter, but lately I have seen some happy results from introducing some of the bolder types of perennials in a thinly planted shrubbery. This week I saw a mass of *Verbascum phlomoides*, with its dense columns of pale yellow bloom, from eight to ten feet high, rising out of a mass of *Spiræas* which, since their flower time, were an insipid group. I have rarely seen so striking an effect. Other instances of brightening shrubberies were made by groups of the tall *Aconitum autumnale*, eight feet high, single-flowered Hollyhocks, various American *Helianthus*, *Cimicifuga racemosa* and the taller *Solidagos*, all of which are suitable for combining with shrubbery if planted in sufficiently bold masses. In some of the Scotch woods I saw, beneath the great ruddy boles of Scotch Pines, broad, spreading masses of the Evening Primrose, *Oenothera Lamarckiana*. The effect of this golden glow of color in the shade was most pleasing.

It is sometimes a difficult thing to make shrubberies attractive after midsummer, and until some fortunate dis-

* The typical *Salix occidentalis* is Cuban, and marked mainly by being more or less cinereous-pubescent, but forms of var. *longipes* from southern Florida (= *forma gongylocarpa*, Andersson) present an evident transition from the more northern var. *longipes* to the West Indian type.

covery is made of autumn-flowering shrubs we must trust for flowers among them to the methods already described. We have, indeed, a few late summer-flowering shrubs, as *Hydrangea paniculata*, which is especially effective when associated with some bright-tinted shrubs. I have just seen a large mass of it, the clusters of bloom a foot in length, with a broad margin of that lovely new *Spiræa*, Anthony Waterer, the most brilliant form of the *Spiræa Japonica*. In a garden on the south coast I recently saw the crimson *Fuchsia Riccartoni* taking the place of the *Spiræa* with the happiest result.

These combinations of different colors of shrubs and flowers are valuable in proportion to the harmony of their various tints. If women, with their acute taste in matters of color, possessed a broad knowledge of plants they would be among the most successful practitioners in gardening of this kind. In some formal garden beds beautiful effects are obtained here from masses of Carnations of harmonizing tints. A strong combination recently noticed was of pure white and chrome-yellow carnations, the great mass of these flowers surrounded by a broad band of the scented oak-leaved *Pelargonium*, its foliage just the right tone of green to combine with the yellow and white. Great improvements have been made in artistic and decorative gardening during the past few years in England, much of which is due to the good examples in public parks, and public taste has also been considerably influenced to an appreciation of proper color-schemes by the displays in Kew Gardens. Private gardeners come a distance of several hundred miles to visit the national garden and to carry into practice in private gardens the suggestions received here. The result is that the rows of scarlets, yellows, blues and similar crude and painful mixtures are giving way to more pleasing combinations.

It is now a common remark that there is a picturesque Kew and a scientific Kew, and I have never heard any one venture an opinion that the more decorative element has in any way interfered with the strictly botanical one.

Kew.

W. Goldring.

Plant Notes.

LIRIODENDRON TULIPIFERA.—At this season, when the foliage of many trees begins to grow dull, the broad glossy leaves of the Tulip-tree are conspicuous for their cleanliness and purity of color. It has been urged against this tree that many of its leaves fall in late summer and early autumn, not in sufficient numbers to injure the appearance of the tree, but enough to litter up the grass and make a lawn untidy. The fact seems to be that in very dry weather the tree has the habit of allowing part of its leaves to ripen and fall, so that those which remain are abundantly supplied with moisture and keep their freshness until autumn, when they all turn to a pure light yellow, which makes a pleasing contrast to the deeper colors of the Oaks and Maples. The tree itself is one of the largest in our forests, not infrequently reaching a height of one hundred and fifty feet, and specimens whose trunks girth twenty to twenty-five feet, breast-high, are still to be seen. The tall, straight and massive trunk of a forest-grown Tulip-tree, with ashy color, fine texture and regular ridges and furrows of its bark, is not excelled in grandeur by any feature of our woods. A tree growing in the open fields, well furnished with branches to the ground, is equally beautiful, and in any situation it justifies the judgment of Downing that this is the most stately of our forest-trees. When comparatively young it is a tree of great refinement of expression, and it is one of the very best of trees for avenue planting, and its Tulip-like flowers add to its beauty in June. The common name, Tulip Poplar, is possibly derived from the fact that its leaves, borne on long slender petioles, quiver in the wind like those of the Aspen. Although it was introduced into England two centuries and a quarter ago, and has been largely planted in Europe, very few garden varieties have become established. The

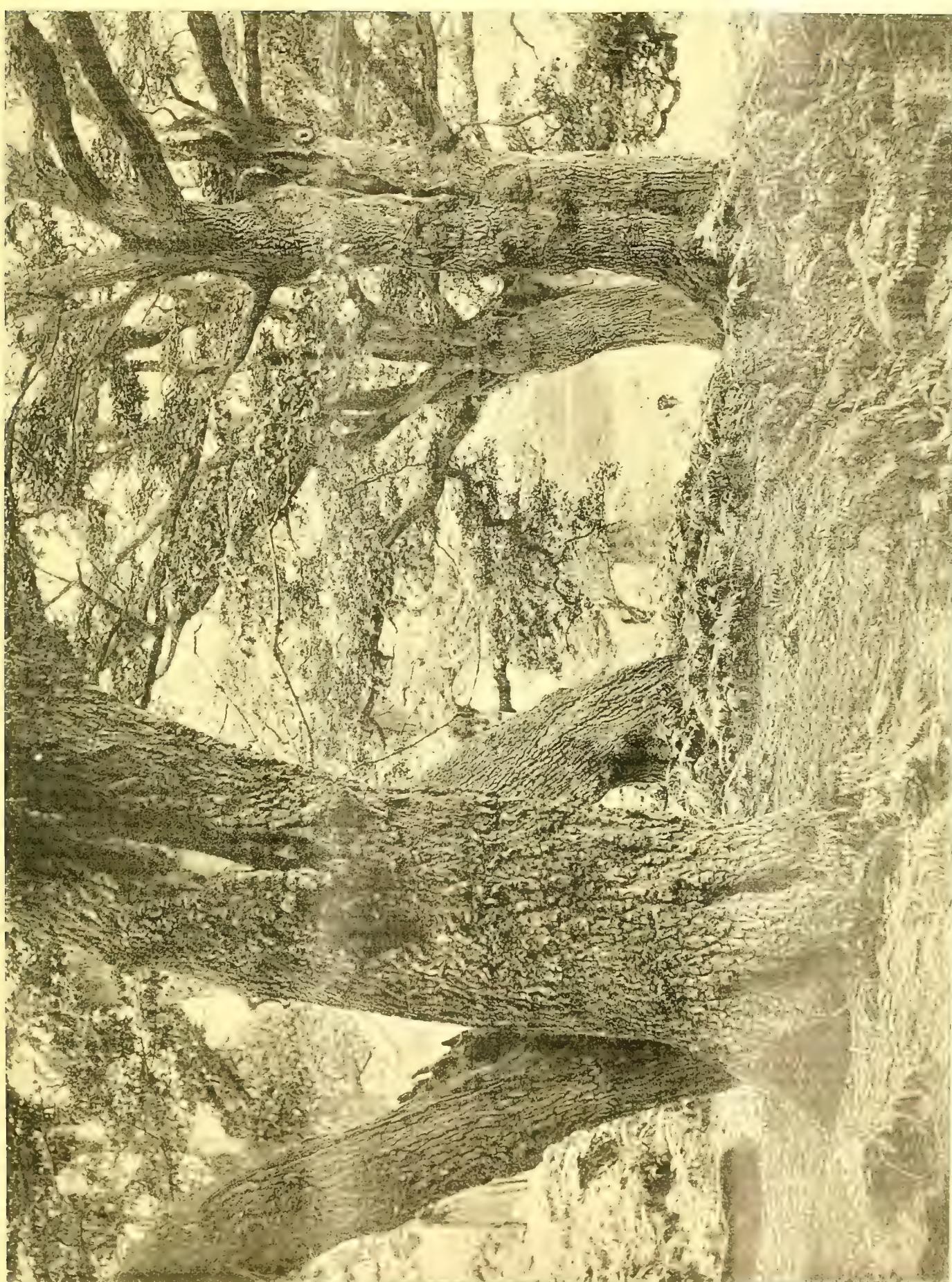


FIG. 1.—Oaks in Shou-wu (Shou-pu).

most interesting one was sent out from a German nursery a few years ago. It is strictly fastigiate, and promises to be useful wherever trees of a slender columnar form are needed.

ERICAS.—Few of these can be classed among strictly hardy plants in our north-eastern states, but in many situations several of them seem to be as much at home as our native plants. Last winter was a trying one for many shrubs, but the Ericas endured the season fairly well and are now well in bloom in the Arnold Arboretum. The Heaths do not like the shade or drip of trees, but on some such place as a sheltered tussock in a meadow in full sunshine they probably could be naturalized. While they like peaty soil they will do well in a deep sandy loam if it is not too wet. *E. vagans*, *E. Tetralix*, *Calluna vulgaris* and its varieties are now in bloom.

HIBISCUS Coccineus.—This southern plant, which grows wild in the swamps on the coasts of Georgia and Florida, attains a height of from five to seven feet in cultivation, and bears great numbers of flowers, which are more conspicuous both for size and color than those of any other herbaceous Rose Mallow. The bright red corolla is often eight to ten inches across, and even more, and the appearance of the plant in full bloom is strikingly beautiful. Single specimens grow into erect pyramidal shape with one central stalk, but, since the foliage is rather scanty, the plants may be set somewhat closely, and in this way they make most effective groups. The deeply cleft leaves, as well as the stems, have a bluish tint, which adds to their distinct appearance. Of course, this species is not thoroughly hardy in this latitude, but the root can be safely stored during the winter in a cellar or under a greenhouse bench, and it is certainly worth this extra attention. It has been known to winter safely out-of-doors as far north as Philadelphia. It may be added that plants grown from seed raised in northern gardens will endure the winters better than those which come from the south, and this is true of many other plants which come from warmer climates.

PENTSTEMON CAMPANULATUS.—This beautiful Mexican species is rarely seen in our gardens; perhaps, because it is not quite hardy. The plant is as easily raised from seed as any of our common garden annuals. If the seeds are sown in March the plants will begin to bloom in July. Mr. Cameron, of the Harvard Botanic Garden, notes the fact that many of our tender native species of Pentstemon make a better display in late summer and fall by raising them annually from seed. The flowers of *P. campanulatus* vary in color; some of the plants have flowers of a pink shade, while others have dark purple and violet flowers. The specimen before us has a tubular or campanulate corolla of a red-maroon color, and the petals are whitish on the inside. The flowers are produced in long showy raceme-like panicles, which are nine to fifteen inches long. The plants are three feet high, and the stems are thickly covered with dark green, ovate, lanceolate, serrated leaves. It grows best in a light rich soil and in a position where it is not shaded.

IPOMÉA LEARII.—Among the tropical Morning Glories, this is, perhaps, the best and most floriferous. The flowers are fully four inches across, produced in great profusion throughout the summer and autumn months. They are intensely blue, slightly purple in the throat; the color is a most pleasing one, and the lasting quality of the flowers is considerable. The inflorescence, a compound fascicle, produces from twelve to thirty almost stalkless flowers in succession, and the axillary peduncles are eight to ten inches long. The cordate leaves are occasionally imperfectly three-lobed, but mostly entire, six inches long on slender, equally long petioles. The twining stem is very slender and somewhat hairy. This species, although a native of Ceylon, often goes by the name of Mexican Morning Glory, a name properly belonging to the nearly related *Ipomoea rubro-cœrulea*. It can be propagated by means of cuttings very easily in this country. Rich fibrous soil

is most satisfactory, but comparatively small pots are sufficient even for large and floriferous specimens. A northern or western position, in diffused sunlight, is preferable to any other, as the flowers in such a position will last till late in the afternoon. Ordinary summer temperature is quite sufficient, and the plant is well adapted to outdoor use on trellises, on walls or verandas, where its hundreds of flowers will make a gorgeous and effective display. Plants used during the summer for such purposes may be cut back before the fall frosts commence, and should be stored in a somewhat dry state until the following season in a cool greenhouse or a light and frost-free cellar.

Cultural Department.

Notes on Hardy Perennial Plants.

AT this time *Cedronella cana* has showy spikes of purplish flowers. It is a neat hardy plant from Mexico, and a small bed eighteen inches wide by three feet long is very attractive. The height of the plants varies from two to three feet, and the square stems have ovate-oblong fragrant leaves. A light warm soil and a sunny position suits them well. Young plants are very easily raised from seed sown in spring.

The prettiest and showiest Malvaceous plant in bloom is *Callirrhœ involucrata*. It is a dwarf prostrate perennial, and although some of the descriptions say the stems only grow two feet long, under good conditions here they are more than five feet long. The stems are thinly clothed with rounded leaves, which are five-parted and the segments incisely lobed.

The flowers are produced singly in the axils of the leaves. The hairy peduncles are from four to six inches long, and the large, showy, purplish flowers are two inches across. This *Callirrhœ* makes an excellent rock-garden plant, where its long prostrate stems can hang over rocks, and in such a position its flowers are seen to the best advantage. When this plant gets a congenial situation it blossoms continually all summer. A light rich soil and plenty of light is necessary for the welfare of this plant. Here we have to protect the old plants with a good deep covering of leaves in the winter. Young plants which are raised from seed in spring make a good display in summer if the seeds are sown in March and planted out in May.

Some of the blue-flowered Aconites are valuable fall-flowering perennials. They help to break up the monotony of yellow shades which are so plentiful in the garden at this time. *A. autumnale* is a very desirable plant, and one that deserves to be grown by all lovers of hardy perennial plants. It is a distinct and stately plant, attaining a height of four feet or more when well grown. Its stems are thickly covered with thick dark green leaves, which are deeply cut and slightly drooping. The rich bluish purple flowers are produced plentifully in loose panicles, and when large clumps are grown they make a good show. The second row from the back of the mixed herbaceous border is a suitable place for this plant, and it likes a deep rich soil. It has fibrous roots, and is propagated by division in the fall or spring.

The common Monks-hood, *Aconitum Napellus*, is showy at this time with its large terminal racemes of blue flowers. It grows from three to four feet high, and makes a good companion in the borders to the fall-flowering Phloxes. This plant is poisonous, and care should be taken when planting that it is placed in a position where no danger will arise from its presence.

Statice latifolia is admired by almost every person when it flowers profusely and is well grown. Its large, loose, airy panicles of small blue flowers are produced in great abundance. They are often compared to those of *Gypsophila paniculata*, and are quite as useful when cut for mingling with other flowers. The plants grown in the borders here are large, measuring a yard or more across when they are in bloom, and about a foot and a half high. It is very hardy and requires no protection in winter. When large established plants have to be moved care should be taken that the long thick roots which they make are not broken too much, as the plants do not bloom so well the first year after moving if the roots are destroyed. As the roots go down several feet in the soil, it is beneficial to give them a deep rich one. Seeds are produced plentifully, and young plants are easily raised from them and bloom the second year.

Sedum spectabile, with its massive heads of small rosy purple flowers, is now very effective. This is the handsomest plant of all the hardy Stonecrops. It is so easy to grow, and its needs so easily supplied, that it should be one of our com-

monest fall-flowering perennials. It is an erect plant with stout stems twelve to eighteen inches high, and has broad glaucous leaves. The rosy purple flowers are produced in broad corymbs at the ends of the stems, and they last for several weeks. *S. spectabile* grows fairly well in shaded positions, but it does best in a sunny place. It will grow in almost any kind of garden-soil, but it produces larger corymbs and broader and longer glaucous leaves when given a deep rich soil.

Catananche caerulea is a south Europe Composite which has been flowering very freely for several weeks. The flower-heads are blue, and borne singly on stalks which are nearly two feet long. The flowers are produced plentifully on strong healthy plants, and they last well when cut. There is a form in bloom now which has flowers of a blue and white color, and is known as *C. bicolor*. Both are good border plants and grow in any ordinary garden-soil. In spring they are easily raised from seed, and the plants bloom the following summer.

Harvard Botanic Garden.

R. Cameron.

GEUM MONTANUM, a European species of Avens, is conspicuous in late spring with its wealth of large, bright yellow erect flowers, each an inch and a half across, borne on long leafy stems well above its tufted dark green foliage. In ordinary soils the plant thrives well and blooms abundantly, forming broad, slowly spreading tufts.

Geum miniatum is a charming plant, growing nine to fifteen inches high and producing bright glowing orange flowers in few-flowered clusters, each individual flower being about three-fourths of an inch in diameter. The plant forms a low-tufted mass of light green foliage and thrives well in all situations tried. *G. coccineum*, or *Chiloense*, cannot be trusted either in its typical forms or its double and various-colored varieties in the neighborhood of Boston, owing to spring rot.

Most of the Oriental Poppies are through blooming by early July, and the Iceland and Alpine Poppies are not happy in the scorching summer months, except in cool situations. A species, therefore, that will carry on the bloom during this interval is especially desirable, and *Papaver strictum* fills the requirements. A native of the higher portions of the Altai Mountains, it forms with us a many-stemmed plant of dense growth, with densely hairy, glaucous foliage and branched flower-stems rising to a height of eighteen inches, with a constant succession of saffron or deep flesh-colored flowers, making a brave daily show up to noon on hot days and continuing to bloom until mid-September. Though hardly adapted for cutting, on account of its fugacious petals, as a border plant it is unique. It has proved a good perennial and perfectly hardy. I first had it under the name of *P. croceum*, but importations of *P. strictum* seed from a reliable source produced the identical plant.

Malva alcea, the Hollyhock Mallow, bears flowers of a clear rich pink, devoid of any traces of purple. Plants which produce flowers of medium size and in succession are not common in gardens, and therefore this is a desirable species. It is of European origin, making a large, broad, densely branched bush, four to five feet high and as much through. It comes into bloom in early June and continues up to late September. Individual flowers are an inch and a half across, of rich clear pink, and borne in clusters on every branchlet. It is so seldom that catalogue promises of persistently flowering plants are fulfilled in actual practice that I am glad to say that there has not been a day between the dates named when I have not been able to pick an abundant quantity of flowers from a single specimen of this plant in my border.

As I saw *Geranium armenum* last year both at Geneva and Brussels, as well as in Kew Gardens, it seemed the best of all the species of Cranesbill. The plant formed a vigorous clump, with good foliage and showy flowers, which were borne in flat clusters. Each flower was about an inch across and of a brilliant red color. This is said to be a constant bloomer, even into the fall.

Echinacea angustifolia is now in perfection, forming moderately bushy, self-supporting plants some two to three feet high. In many respects this species is preferable to *E. purpurea*, the purple Cone-flower, since its petals do not recurve as they do in the latter species. The flowers are three inches or more in diameter, well opened, and vary in color from rich purple to pure white in its various forms. The stems are long and slender, not as stiff as in *E. purpurea*, and much better adapted in consequence for cutting purposes. The species is a native of Wisconsin and southwards and blooms from July to September.

The double White Campion, *Lychnis vespertina*, until late

years seems to have been quite lost to cultivation. We are indebted to Europe for the ordinary single form, where it is a common meadow plant. The flowers are pure white, an inch and a half across, very double and quite fragrant during the early evening hours. The plant has a compact bushy habit, about two feet high, and consists largely of flower-stems. In good soils, where there is little danger of drought, it is in constant bloom from early June to late September. No plant in my entire collection gives more general satisfaction than this. The only weak point that I can name is that when severely affected by drought the foliage becomes infested with a rust, which, however, does not injure the flowers. The remedy of good culture is so simple that this disease is of little moment.

Reading, Mass.

J. Woodward Manning.

Cannas.

FEW bedding plants give as much satisfaction as the modern French Canna. Cannas are easily cared for in winter, easily started in spring, and with good, rich soil are almost a certain success. The general characteristics of the florists' Cannas are so well marked that, although scores of new varieties are introduced every year, it is quite easy to include all the best in a selection of twenty. There are lacking the trifling differences we find in Roses, Carnations and Chrysanthemums which fix the popularity of one variety above another in different sections of the country. The best crimson Canna is the best everywhere. The same can be said of other colors. In the march of improvement every step is toward a certain ideal which all growers and raisers aim for. The typical Canna should have the terminal truss, or spike, erect and well developed; the flowers should be large; the petals broad and long-limbed, so as to make an evenly rounded flower, standing well out, spreading rather than erect, not bunched, but evenly distributed on all sides of the flower-stem. The new crimson F. R. Pierson comes nearest to this ideal.

Captain Suzzoni, until this season the best light-spotted yellow, is now superseded by Madame Montefiore, the flowers of which are rounder and more evenly placed. Mrs. A. D. Cowing is another fine variety of this color, but much more dwarf than either, and better suited for the front row. Eldorado, one of this season's introductions, is a very fine yellow, with faint spots. It is practically yellow. It has not, however, done well so far as I have seen, so that further trial will be required to properly test it. Should it prove free and vigorous it will be an acquisition. Florence Vaughan, as a dark-spotted yellow, is without a peer. As a bedder it is practically orange, as seen from a distance of twenty-five yards. It shows up well everywhere. In form and the arrangement of its flowers on the spike it is equal to the best type. Madame Dugas is the one variety which, in point of beauty, comes nearest to Florence Vaughan, but the tones are softer and the habit more dwarf. Rose Unique is a free-blooming pink. This is about all that can be said in its favor. It suffers by comparison and should never be massed with other Cannas. Its place should be among subtropical plants.

There is some divergence from the Madame Crozy type, but no decided improvement, and no variety is fit to supplant it, though variations from the Crozy type have given us many handsome varieties. Souvenir d'Antoine Crozy is undoubtedly the best. The scarlet ground is a trifle deeper in tone; the distinct yellow border is fully one-eighth of an inch deep and uniform. A mass of this Canna at Mr. James Farquhar's, of Claredon Hills, Massachusetts, makes a beautiful display. Mrs. Fairman Rogers, which was honored with a silver medal by the Massachusetts Horticultural Society, has proved disappointing so far as I have seen. It was shown from plants grown indoors as a giant Crozy, with a wide yellow border. Planted out it is in no way superior to Madame Crozy. Still further deviation from the Crozy type shows a wide and irregular yellow border, denoting the influence of the yellow varieties in the breeding. Queen Charlotte is the handsomest of these that I have seen; the yellow and the crimson in it are about equally divided. Next comes Vanden Berg, Junior, with scarlet in place of the crimson ground; the petals are broad and the arrangement of the flowers good. As a bedder this is a striking novelty of medium height and sturdy growth. Madame Bouvier is similar to the last named, but a foot taller.

We have some fine varieties of scarlet and orange shade. Paul Bruant is a scarlet, extremely rich in tone, with broad, wavy, satiny petals and a large well-developed spike. Mrs. J. M. Samuels is another good variety, with large, broad petals, of bright orange-red color. It is a fine grower. Helen Gould is a large, loose-petaled, orange-red, with a peculiar crystal-like lustre, which is perfectly charming.

Among orange shades it is unique. General Mirabel is also orange-red. It is compact in habit and dwarf, and for this reason it is well adapted for the front row. Sunshine is a lustrous orange, in the way of Paul Marquant, but more dwarf. Both these varieties are better under glass, their flowers scorching easily under bright sunshine. There are few good varieties among vermillion shades; C. H. Molis and Columbia are the best. The latter has probably the largest truss of any known Canna, but is not of good form, being irregular and bunched.

There has been great improvement among crimson shades during the past few years. Alphonse Bouvier was a wonder. We had never seen anything equal to it. When Charles Henderson was introduced last year it was doubted whether it could possibly be an improvement on Alphonse Bouvier. It did not get strong enough last year to establish its claim, but this year it is everywhere in grand form. We have another Canna this season even better in form and nearer the ideal. As a crimson I do not consider it quite as good as Charles Henderson. The petal limbs are yellow, forming what would appear to be a yellow tube, and the staminate petal is also yellow, which, to my mind, detracts rather than enhances its value.

In dark-leaved varieties we should expect little improvement in the size of the flowers, since they are used principally as foliage-plants, but advance in size and color of the flowers has been as great as in the green-leaved varieties. I consider J. D. Cabos the most beautiful of all. The habit is sturdy and free. The spike is neatly formed and free from laterals; the color is clear orange. President Carnot is a giant and a grand foliated plant. C. Vaughan carries a spike of scarlet flowers equal in size and form to any green-leaved variety.

T. D. Hatfield.

Wellesley, Mass.

Notes from Cornell University.

Fruit Rot.—The fruit rot, *Monilia fructigena*, on plums and peaches is more prevalent than usual the present season in this vicinity. Many trees that gave promise of a good crop have lost half or more of their crop by this fungus. Generally the fruit alone suffers, but there are many instances this fall, especially in early peaches, in which the foliage is attacked also. The fungus causes the leaves to become discolored and die. It has been shown by Craig (Bulletin 23, Central Experiment Farm, Ontario), that the rot can be lessened by spraying with Bordeaux mixture after the blossoms fall, and that two or three applications are needed during the season, the last being with ammoniacal copper carbonate a few days before picking.

Russian Apricots.—The Russian Apricots at the station bore a full crop. The following varieties were in fruit: Gibb, Budd, Alexander, Nicholas and Catherine. All of these varieties are too small and the quality too poor to compete with other apricots. The Gibb, Alexander and Budd are the best. The Catherine is worthless, being very dry, and the Nicholas splits badly.

Prunus Simoni.—While *Prunus Simoni* has the reputation of being a light bearer, our trees were overloaded this summer, and had to be thinned. The fruit began to ripen about July 20th, and continued till August 15th. It is but little attacked by curculios, but is quite susceptible to rot. The use to which *P. Simoni* can be put is not yet clear. The fruit as grown here is not edible, having a peculiar flavor, somewhat like oil of almond, and though cooking lessens this flavor, it does not make it a palatable sauce. We have not tried *P. Simoni* for a grafting stock, and until we know more of the general habit of the tree it cannot be wholly condemned.

Cornell University.

G. Harold Powell.

Istotoma longiflora is a West India perennial plant, allied to the Lobelias, which deserves more attention than it usually receives. It is at its best when raised from seed sown indoors, for it makes a considerable growth before flowering time. The flowers are snow-white, at least an inch across, with a long corolla tube, making them altogether distinct and showy at this season. Seed is produced abundantly.

Caladium argyrites is well known as a useful little plant for greenhouse decoration, growing continuously through the winter without any rest if it has a suitable atmosphere. It can also be used successfully as an outdoor bedding plant, if it can have the benefit of partial shade. The bulbs are so small that they ought to be started into growth before they are set out in the open ground. It is easily multiplied; indeed, few of the Caladiums increase as rapidly, since every little shoot, if it has but a small piece of the bulb attached, will make roots when put into coarse sand and become a good-sized bulb in the course of a month or so.

Botanic Garden, Washington, D. C.

G. W. Oliver.

Correspondence.

Origin of the Name Sambucus.

To the Editor of GARDEN AND FOREST:

Sir,—In a note in a recent number of your paper reference is incidentally made to the etymology of the word *Sambucus*, which, according to all botanical works that attempt to explain the meaning of genus names, is derived from σαμβύκη, a Greek name, of Syriac origin, for an ancient musical instrument. This statement is an error that needs correction.

Sambucus as a name for a species of Elder dates back only to about the eleventh century, and is a badly corrupted word.

Chapter cxlviii. of the *Herbarium of Apuleius*,^{*} a work supposed to have been written in the fourth century, is devoted to the virtues and uses of the plant σαμβύκον. In a tenth-century Anglo-Saxon translation of this work, the translator identifies this plant as the Elder. Such identification, although erroneous, was accepted, and the word passed into the plant lists of the eleventh, twelfth, thirteenth and succeeding centuries of the middle ages as a gloss for "Ellen" and "Eller" (the Anglo-Saxon and Middle English names for the Black or common Elder), in the corrupted forms *Samsuchon*, *Samsuhton*, *Sambucus*, *Sambucum*, *Sambuca* and *Sabuca*. The form *Sambucus* was adopted by the ante-Linnæan botanists for the different species of Elder, and has been perpetuated to the present day. The work of Apuleius is founded in great part upon the *Materia Medica* of Dioscorides, whose office of military physician carried him to different countries and enabled him to embody in his work a considerable number of plant synonyms from various languages. Among such names foreign to the Greek tongue is the word σάμψυχος, which is of Coptic origin, and means, according to Rossi, in his dictionary of that language, "Crocodile herb." The plant thus named has been identified by the commentators of Dioscorides as *Origanum Majorana*.

New York.

W. R. Gerard.

Rhus Poisoning.

To the Editor of GARDEN AND FOREST:

Sir,—You ask for a statement from me as to the poisonous principle in *Rhus Toxicodendron*. I wish such statement could be made with confidence, but it must be acknowledged that I do not know as much about the matter as I once supposed I did.

In 1882 I communicated to the American Association for the Advancement of Science a paper in which this and some other vegetable poisons were referred to bacteria as the active agents. Early in the following year, among other new species of bacteria, the one supposed to have to do with *Rhus* poison was named *Micrococcus toxicatus* and described in the *American Naturalist*.

In the former paper the poison of Mushrooms was stated to belong to two very different agencies. One is a narcotic and the ill effects follow closely after the substance has been swallowed, after the fashion of other true poisons. The other becomes known only after several hours or one or two days. In the first case no lesions of importance are produced; in the second, violent inflammation and ultimate mortification of the intestinal tract occurs. It was the latter to which the agency of bacteria was ascribed.

It is well known that in *Rhus* poisoning the effect shows only after twelve to twenty-four hours, suggesting incubation. This led me to undertake some studies upon the matter. I put some carefully secured juice of the growing plant upon a marked spot on my arm. Very serious results followed, though I had not considered myself very susceptible to the poison. After twelve hours the spot was slightly reddened; at the end of twenty-four hours it was considerably inflamed and somewhat swollen, but was still nearly confined to the originally infected area. During the next twenty-four hours the inflammation greatly increased and spread widely until nearly the whole forearm became involved. Colorless serum began to exude, first from well-defined papules, then apparently from the entire surface. This serum was transferred to other parts of my body, and in one instance produced similar inflammation.

Minute spherical bodies had been found in the milk-sap of the plant, and similar ones were seen under high magnification in the exuding serum. These were taken to be micrococci. At this time no attempts were made to cultivate them in artificial media, and no other demonstration was had of the

* *Herbarium Apuleii Platonici quod accepit Escolapio et Chirone Centauro magistro Achillis.*

truthfulness of the assumption that the spherical bodies were living organisms. Infection experiments upon myself were discontinued for obvious reasons. But following up the idea of the parasitic nature of the disease (?), applications were made of various germicidal agents, with apparently favorable results. Since that time abundant evidence has been had of the value of carbolic acid—two to three per cent.—in glycerine as a palliative or curative lotion.

But some studies made a few years later tended to discredit the agency of bacteria in the case, at least as self-acting parasites. The particles in the milk-sap of the plant were found to be constituents of it, rather than independent organisms. As upon other leaves, there are various kinds of bacteria common on those of *Rhus Toxicodendron*, but none could be found capable of such effects upon the skin. There are living organisms in great numbers, at least at times, in the exuding serum; but no cultivations from these were successful in securing such as cause inflammation. Here the matter was again dropped. There still seem to be some reasons for supposing bacteria have to do with the irritation, but proof of it must be considered wanting.

Mr. C. O. Boring, of Chicago, himself very susceptible to the poison, is confident that the parasitic theory is the true one. He feels very sure that he has been badly poisoned by simply being in the vicinity of the shrub, without contact with it. The late President Clark, of Massachusetts Agricultural College, unhesitatingly asserted that this method of poisoning was well known, and this seems to be a popular belief. It is said one is much more liable to be thus poisoned if he is perspiring at the time.

If it is true that poisoning actually occurs without contact with the plant, something more subtle and more virulent than any known chemical substance must be assumed. To our senses the air is absolutely free from noxious properties after blowing over the plant. What chemical compound can there be in such air, so infinitesimally charged, capable of such notable results? But the facts in this case should be put beyond controversy before explanations are undertaken. Who can give them so substantiated that a skeptic must believe?

If it proves true that actual application to the skin of the plant, or of its products (aside from any invisible something), is essential to produce the inflammation, the first suggestion of bacteria in the case falls. What then of the apparent period of incubation and of the possible activity of the exudation from infected skin?

It is true the matter ought to be absolutely settled by proper investigation, but it is no trifling affair to experiment upon one's self. There may be some other method of procedure, yet no one knows what without trying. I have not tried.

University of Illinois.

T. J. Burrill.

Meetings of Societies.

The American Forestry Association.

THE summer meeting of this society was held at Springfield, Massachusetts, on September 4th and 5th, in connection with the American Association for the Advancement of Science. The Hon. G. F. Talbot, of Maine, argued that all worthless lands forfeited by tax sales be permanently held by the state and devoted to the purpose of the production of trees, to which end they are admirably adapted. He spoke of the fire-laws of Maine and stated that the adverse interests of forest-owners was the great obstacle to any reform in controlling forest-fires. Under a sharp competition the land is stripped of everything salable and the refuse left where it happens to fall, and this ultimately becomes, through its inflammability, a menace to all neighboring property.

Mr. George H. Moses, Secretary of the New Hampshire Forestry Commission, reviewed the history of legislative attempts to provide suitable protection to the forests in his state, and spoke of the creation of the present Commission, organized simply to investigate the extent and character of the forest-cover and the general relation of forests to climate, water and health. Much of their energy has been devoted, however, to efforts at convincing lumbermen that it is for their personal interest, as well as that of the state, to introduce less wasteful and destructive methods. They are also striving to preserve the natural beauty of the White Mountain region as a summer resort, since, if this is destroyed, great annual loss will come to the state as a whole. Mr. Joseph B. Walker followed with a description of the present condition of the forests of the same state, especially those in its northern portion. Here large areas are owned by individuals whose sole object is to make the most money in the shortest period, and who have no interest

in obtaining a future crop of trees. Everything is cut which can be sold either for lumber or matches. Vast sections are denuded one after the other, and fires in the "slashings" sweep the ground clean after the lumbermen have left. There is a beginning mainly from the sentimental side, to make an attempt to prevent this great destruction, and the fire-laws have been so improved that the selectmen or county commissioners are required to appoint fire-wardens, whose duties include the watching for fires and the summoning of aid to prevent their spread. No penalty for failure is provided, but popular sentiment is being aroused to such an extent as to render the law generally effective. The farmers are beginning to appreciate the necessity of the forests, as these, if properly managed, will furnish them with opportunities for labor during the winter months. At present the farmer labors seven months of the year, and from his farm alone could not derive revenue for the remaining five months.

Mr. Cornelius C. Vermeule, of the New Jersey Geological Survey, read a paper upon forests and rivers, based mainly on observations of conditions within the state of New Jersey, although some use was made of data from Massachusetts, New York and Pennsylvania. His conclusions were that river measurements have failed to indicate any notable effect of forests upon evaporation or upon the very highest or lowest rate of flow. They do show what is quite as important—namely, a more equable flow, fewer floods and shorter periods of extreme low water upon well-forested catchments. Some of Mr. Vermeule's conclusions were called in question by Mr. Fernow as not being applicable beyond the areas studied, and especially because all meteorological measurements are extremely unreliable, due to lack of suitable instruments. Professor J. C. Smock, State Geologist of New Jersey, stated that some of the largest landholdings in that part of the country are in southern New Jersey, where the main source of anxiety is the forest fires. One of them alone burned over and destroyed probably a million dollars' worth of lumber and other property. Such a fire leaves only the bare white sand, destroying even the soil.

A letter was read from Secretary Morton, President of the association, calling attention to the necessity of state legislation to compel the proper care of waste from timber-cutting, in order to prevent forest fires; and of the necessity of co-operation between the United States Geological Survey and the Forestry Division of the Agricultural Department, in order that the forest areas might be properly represented on the topographical maps. He showed that by slight additional expense it would be possible for an expert to classify the woodlands while the map was being made, and obtain the material for a report upon the condition and value of the forests. By this means the completed map would show not only the altitude and slopes of the country, the roads, trails and improvements, but also the character and extent of the timber. Mr. F. H. Newell, Secretary of the association, described the methods of representing wooded areas on the great map of the United States now being prepared, and dwelt upon the benefits which would follow the more accurate designation of timber-lands. By suitable co-operation of the Agricultural Department, it might be possible to concentrate efforts upon the areas covered by the national forest reservations and complete the mapping and description of these within a few years.

Professor Dwight Porter, of the Massachusetts Institute of Technology, discussed the possible connection between the fluctuations of the water-supply in the Connecticut River and forest removal. His general conclusion was that, as far as the flow of the lower river is concerned, there is no proof of permanent injury through cutting of the forests at the headwaters. Sea-coast planting as practiced on the Province lands of Cape Cod was the subject of a paper by Mr. L. W. Ross, of Boston, who described the attempts being made to prevent the shifting sands at the extremity of the cape from injuring the settlements and harbor. He spoke of the various kinds of Grasses and shrubs which have been planted to hold the sands, and of the results attained, and exhibited specimens showing the cutting of the twigs due to the sand carried by the wind.

Mr. R. U. Johnson, of *The Century Magazine*, explained the action of the New York Board of Trade and Chamber of Commerce, and urged the advisability of endorsing the resolution of that body calling for the creation by Congress of a forestry commission, consisting of three persons, empowered to examine into the forest conditions of the country. Mr. Gifford Pinchot, in a paper upon the present condition of the national forests, and the necessity of action in protecting these, also held that, since past efforts of this association had been, in a large degree, ineffectual, that the proper method of procedure was through a forest commission such as that pro-

posed by Mr. Johnson. His views were strongly controverted by Mr. B. E. Farnow on the ground that the time was ripe for action rather than for investigation, and that Congress would be more likely to consider legislation already discussed during the past session rather than take a backward step in the appointment of a commission. After some discussion, and under a suspension of the rules, the following resolution was adopted:

Resolved, That we, this association, join with the New York Chamber of Commerce and Board of Trade in hearty advocacy of the establishment of a forestry commission of three members to make a thorough investigation of the public forest lands and to make recommendations concerning their disposition and treatment, and the Executive Committee is hereby directed to represent the association in support of such legislation.

Notes.

An orchard of more than one hundred trees of the Alligator Pear, *Persea gratissima*, has been planted by Mr. Kinton Stevens, Montecito, California.

It is stated that the Southern California Acclimatization Association has on its trial-grounds eight hundred species of woody plants belonging to 316 genera and eighty-five different families.

Rev. John Batchelor and Dr. Kingo Miyabe have recently printed in the twenty-first volume of the *Transactions of the Asiatic Society of Japan* an interesting paper on plants used by the Ainos in medicine and as food.

The Minnesota Horticulturist asserts that there is no more desirable small tree for the lawn in that region than the native Choke Cherry, *Prunus Virginiana*. The foliage is peculiarly rich and healthy; the leaves appear among the earliest in spring, and not only when covered with its fragrant white blossoms, but when drooping under its burden of shining red or dark crimson fruit, it is a noticeable tree anywhere.

A late number of *The Garden* contains a colored plate of a variety of the Siberian Scilla, which is called Multiflora, and seems quite a distinct break from the well-known plant which has shown little tendency to vary in gardens. Some of the flower-stalks portrayed in the plate are eight inches long and bear half a dozen or more large flowers which are rather lighter in shade than those of the type. It is said to bloom very freely and the flowers appear in England three weeks earlier than those of *Scilla Sibirica*. The variety is also said to have been collected by Mr. E. Whittall in the Taurus Mountains and named by him Taurica.

Professor Hopkins, of the West Virginia Experiment Station, has been making tests with Timothy, and he finds that there are marked varieties of this Grass, some of them early, some of them late, and others showing great differences in size and productiveness of seed. In a paper read before the Society for the Promotion of Agricultural Science at its late meeting at Springfield, he showed that if pure seed of the early variety could be secured it would be of special value to grow with Red Clover, since it would be at the proper stage for cutting when the Clover would have the highest value for hay. There is evidently very much of practical value to be learned from the study of Grasses and Grass seed.

Mr. Isaac Kennedy, of Philadelphia, in speaking of Roses for out-of-door planting at the Pittsburg Florists' Convention, said that the two best hybrid Perpetuals of the year are J. Sherman Crawford and Helen Keller, both introduced by Alexander Dickson & Sons, of Belfast, Ireland. The flower of the first is large and full, a deep rose-pink, with the outer petals tinted with a pale flesh color, and the plant is a strong hardy grower. Helen Keller is a free bloomer of vigorous growth, with flowers large, full, fragrant, rosy cerise in color, and somewhat resembling American Beauty. Among new Polyantha Roses the Pink Soupert is said to be as hardy and free-flowering as the well-known Clothilde Soupert.

We have already noted that great numbers of insects injurious to fruit were killed by the freezing weather in Florida last winter. Unfortunately, the weakened condition of the Orange-trees in that state has left them a prey to other insects from which they suffered little when in health, and the wood-boring beetles are attacking in great numbers those portions of the trees which are not already dead. The remedial treatment recommended is to drive a small wire nail into each hole made by the borer, thus stopping it up and preventing

the insect from laying eggs and finishing its work. A long flexible wire, pushed in as far as it will go, is serviceable when the gallery is longer than the nail. In the enfeebled condition of the trees powerful insecticides cannot be used, nor is it safe to smear the bark with any substance which will repel the borers.

The Northwestern Lumberman calls attention to the fact that the magnificent Oak-forests north of the Ohio River, in the central part of the northern states, have largely disappeared. Within the last five years there has been an increasing demand for oak in spite of business depression, more especially for such timber as goes into house-finishing, including plain and quarter-sawed red oak and white oak. The duration of the Wisconsin red oak supply is now pretty plainly indicated, and in the mean time remnants of Indiana, Ohio, Michigan and southern Illinois oak will have disappeared, except in small farm holdings, and the great bulk of the supply will thereafter come from south of the Ohio. Of course, there is oak in all the southern states, but the alluvial bottom-lands must furnish the great bulk of the timber, and as Kentucky and Tennessee and West Virginia are partly denuded, the main supply will soon be derived from the lower Mississippi and its tributaries. If the finest area of oak timber in the world, namely, that north of the Ohio River, has been stripped while the country's population and industries were comparatively small, how long will the remaining supply last when the needs are measured by our future population and industrial development? Walnut is gone; cherry, birch and maple will not last many years, and thereafter the demand for oak will be much greater and will rapidly increase. It must be remembered, too, that oak lands are good for agriculture after the timber is cut, and for this reason the denudation will go on with greater rapidity than on the lands less valuable for tillage. When the tide of emigration sets strongly toward the alluvial areas of the lower Mississippi and its tributaries the hardwood forests will melt rapidly away before the attacks of the farmer. It is for this reason that large holdings of southern oak and other hardwoods are now being secured in the south. After a few years, opportunities for such investments on a large scale will be gone forever.

Grape-fruit from Jamaica is found in some of the best fruit-stores in this city, and while much of it is still quite green and undersized, some is fairly ripened. It sells for \$1.50 a dozen. California oranges cost sixty cents a dozen at retail, and lemons find a demand at twenty to fifty cents a dozen. The first Japanese persimmons from Florida retail for seventy-five cents a dozen. Delaware and Maryland peaches are nearly gone, although on Monday the best eastern peaches in the fancy-fruit stores were those from the hillsides of Maryland. These were Late Crawfords and the white-fleshed Stump the World, beautiful specimens of which brought seventy-five cents for a package containing not over three quarts. Selected peaches from New Jersey cost \$2.50 a basket. The peninsular peach crop has not been a large one this year, and was below the average in quality, while prices have been comparatively high. Ready sales at good rates are anticipated for the remainder of the New Jersey crop. Plums from the Hudson River section are in small supply, Damsons and Green Gages costing sixty cents for an eight-pound basket. From California are coming the large Coe's Golden Drop, yellow, marked with red dots; the firm yellowish flesh is especially rich and sweet, and this late variety is highly esteemed for canning on the Pacific coast; a five-pound package brings seventy-five cents. Large heart-shaped Kelsey plums cost \$1.25 for the same quantity. The prices for California Bartlett pears fell considerably in this city last week when large quantities of the eastern-grown fruit were brought out of cold storage, but extra large firm fruit commanded as much as \$1.00 a dozen two days ago, and the best Seckels from the west and from Staten Island sold for thirty cents a dozen. The popular and showy Beurre Clairgeau pears from California cost seventy-five cents. Runyon's Orange Cling peaches of immense size are shown, but though this variety is much thought of in the west, and is said to have a rich, sugary, vinous flavor, as seen here it is leathery, and valuable only for table ornamentation. Later varieties of Cling peaches will continue to reach the east for, perhaps, two months, but Salway peaches, the latest of the free-stones, are already here. Large nectarines, at once delicate and brilliant in coloring, make an attractive display, and some of them are not altogether disappointing in taste to any one familiar with the luxurious product of eastern hot-houses. They sell for thirty to forty cents a dozen. A small shipment of Gros Moroc grapes received from England last Saturday opened the season for this fruit. They retail for \$2.00 to \$2.50 a pound.

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLES: —A Great Battle Park.....	371
Forests and Rivers	371
Cladastis.....	C. S. S. 372
Notes on some Arborescent Willows of North America.—II	M. S. Webb 372
FOREIGN CORRESPONDENCE: —London Letter	W. Goldring 373
NEW OR LITTLE-KNOWN PLANTS: — <i>Litsea geniculata</i> . (With figure).	C. S. S. 374
PLANT NOTES:	375
CULTURAL DEPARTMENT: —Native Composites.....	J. N. Gerard 375
Chrysanthemums.....	T. D. Hatfield 377
The Grapes of the Year.....	E. P. Powell 377
The Vegetable Garden.....	R. A. 377
Asparagus Sprengelii.....	G. W. O. 378
Variation in Corn, Native Plums, Age of Bordeaux Mixture,	G. Harold Powell 378
CORRESPONDENCE: —The Sacred Lotus in Egypt.....	Anna Murray Vail 378
Air Drainage.....	L. C. Corbett 378
Double Sweet Peas.....	B. T. P. 379
<i>Quercus Phellos</i> × <i>rubra</i> in Missouri.....	B. F. Bush 379
Rhus Poisoning.....	R. A. 379
RECENT PUBLICATIONS	379
NOTES	379
ILLUSTRATION: — <i>Litsea geniculata</i> , Fig. 52	375

A Great Battle Park.

THIS week will witness the dedication, with imposing ceremonies, of the great national park, which includes the battlefield of Chickamauga, with parts of Missionary Ridge, Lookout Mountain and other places made memorable by that long struggle which, in the magnitude of the forces engaged, the number of lives sacrificed and the importance of the results which depended upon it, ranks among the great battles not only of our Civil War, but of the world. The field of Chickamauga embraces fifteen square miles, much of which is in forest, and, besides this, the Government has acquired and improved in a most substantial manner scores of miles of road by which the armies marched to the field or left it. The city of Chattanooga, too, which, with its surroundings, made one great battlefield, has made liberal grants of land for the erection of monuments and built a great central drive to the park, along Bragg's line of battle on the crest of Missionary Ridge and through the field of Chickamauga to a point twenty miles away.

Of course, this is not intended as a pleasure-ground. What has been attempted is a restoration of the country to its condition at the time when the battles were fought, with the placing of such monuments and tablets at critical points as will indicate the battle lines and movements of the various bodies of troops throughout the whole series of engagements. Tall observation-towers are to be erected from which the mountain ranges and the rivers can be seen at a glance, so that the strategy of each army can be studied and the history of every operation on these famous fields can be accurately seen. When all is completed it will be possible for the visitor to gain a clear idea of the great military movements across the broad river, among the forests and on the mountain sides. Nowhere else in the world is there an object-lesson approaching this in magnitude of completeness of treatment.

In the current number of *The Century Magazine* General Boynton gives an admirably clear, though concise, account of what has already been done and what it is proposed to do. Commissioners are now at work defining the fighting lines, and it is stated that 106 monuments and 150 granite markers are to be finished and set up before the dedication, besides 129 of these memorials already in place.

What we desire especially to call attention to here, however, is an editorial note in the same magazine in reference to the service which art can render in celebrating the heroes of those days of flame. Upon this hallowed ground something more than historic accuracy is needed, and the appeal to the imagination ought to be made as distinct and powerful as possible. Of course, no art can make Lookout Mountain or Missionary Ridge more impressive than they are, but memorial structures can be erected here which will distract the attention by their obtrusiveness, and if they lack dignity or propriety they will help to belittle the legitimate impressions which the spectacle ought to create. It is truly said in the article alluded to that "there are few pieces of good sculpture on the battlefield of Gettysburg besides the beautiful and appropriate Celtic cross which marks the position of the body of Irish troops. There are a few unobtrusive pieces of natural rock which fittingly express the willing sacrifice or unyielding valor, but, for the most part, that beautiful chosen valley of the nation's salvation has become, through lack of coördination in plan and good taste in execution, an unsightly collection of tombstones." As the fields of Antietam and Shiloh are now coming under Government control, these great battle-fields should not be allowed to become mere cemeteries, and without a protest. To this end certain practical rules are laid down which deserve careful consideration. These are so sound and so judiciously set forth that we reproduce them in full :

1. Every commission should avail itself of the advice of the best landscape-architects, so that park-like effects may be attained as far as may be consonant with the more practical objects of the reservation.

2. Lines of battle should be marked clearly, but unpretentiously, with a low uniform stone, and the whole plan should be worked out artistically before large monuments are erected.

3. The commission should have the advice of a competent board of sculptors, and should be guided by them in the acceptance of plans for monuments.

4. The monuments, to be of artistic excellence, must be few; and to this end the unit of celebration, so to speak, should be the corps. The sense of historical perspective is lost by allowing each regiment to determine the proportions and character of the memorial.

One can hardly hope that the 385 monuments and markers already, or soon to be, in place in Chickamauga are all worthy of the heroic deeds they commemorate, and it is not reassuring to be told that 3,500 acres of forest have been cleared of underbrush and smaller timber so that carriages may be driven through every portion of the park. But every thoughtful person will approve the suggestion that no work of this sort be done in future without "a severe artistic supervision, such as made the Court of Honor of the Columbian Exposition the admiration of the world."

Forests and Rivers.

ONE of the interesting papers read at the Forestry meeting at Springfield, Massachusetts, was that of Mr. C. C. Vermeule, consulting engineer of the Geological Survey of New Jersey, and it related to his investigations of the water-supply resources of that state, an important matter, since considerably more than a hundred million gallons of water are every day consumed by about a million inhabitants. Mr. Vermeule made a personal study of certain watersheds in New Jersey for four years, and, in addition to his own data, he used for comparison a long series of measurements of streams in New England and the middle states. Taking evaporation to mean the difference between the total rainfall and the total run-off of the streams, his conclusions, briefly stated, are that the amount of rain evaporated was not proportioned to the total rainfall, as is often assumed to be the case. Evaporation increased slightly with increased rainfall, but very rapidly with increased temperature of the atmosphere. The stream-flow was found to depend upon the rainfall in connection with the temperature, and little effect upon the run-off was traceable

to forest, to other vegetation or to topography. Examples in three river basins, one of which contained fourteen per cent. of forest, another thirty per cent., and a third forty-four per cent., all showed the same total flow-off for a given annual rainfall, the varying forest areas seeming to have no effect upon evaporation. The Connecticut showed much less evaporation than the Potomac, with about the same proportion of forest, but with a temperature of 2.7 degrees lower, and generally evaporation was found to vary with the mean temperature without regard to the amount of forest. A great number of observations seemed to substantiate this theory, and the conclusions were that in New England and the middle states the effect of forests upon the total flow-off of the streams is not important enough to be shown in the measurements. The influence of the temperature of the air upon evaporation will be appreciated when it is understood that the moisture which is held in the air is doubled for each increase of twenty per cent. in temperature.

In studying the effect of forests upon the greatest and least flow of streams no effect due to the forests was discovered. The heaviest freshet usually occurs when the ground is frozen and warm rain comes on a heavy covering of snow, or else in summer when a heavy rain falls upon the ground already saturated. The rate of flow-off is then determined mainly by topography. The lowest flow occurs when the stream has for a long time been drawing upon the stored ground-water, and has drained it to a point below which it can be influenced by surface conditions. The rate of flow is then mostly affected by the capacity of the earth for holding water and its rate of yielding it up. This is not a matter of vegetation, but of surface geology, and for this reason it is thought the forests have little effect upon the greatest or least rate of the flow of the streams.

These results, it ought to be said, were questioned by some of the experts present, especially because there are no instruments which give perfectly reliable measurements. They are altogether negative, however, and they do not imply that a covering of forest exercises no beneficial effect upon the water-supply. Mr. Vermeule explained that his studies make it clear that streams are often supplied for many months entirely from water stored in the ground. For example, in 1881 the Passaic River was supplied for eight months in this way. With only rain enough to make good evaporation, land in New Jersey will yield up in nine months ground or spring water equal to from 2.29 to 7.59 inches of rainfall. Small barren redstone catchments yield the least water, and the sand and gravel of the tertiary formation the most. If the rain falls uniformly, from two to two and a half inches a month may be taken into the ground and discharged thence into the streams. The entire rainfall of an average year, less the evaporation, could be thus taken into the earth and none need flow over the surface into the streams. Anything, therefore, which affects the capacity of the earth to take up water and to control its rate of discharge into the streams affects the stream-flow by making it more or less uniform throughout the year. And here the generally recognized good effects of a forest-cover in holding back water until the earth can take it up are seen. The basins which have the largest proportion of forest invariably showed the best-sustained flow in a dry season, although the total run-off was no greater. The streams of southern New Jersey which have the most forests are remarkably steady, the dry-season flow averaging twice as much as that of the northern rivers. This is due, undoubtedly, in large part to the absorbent power of the sandy soil; but a critical study of the daily flow of these rivers shows that the Cedar swamps contribute largely to the result. Should these be all cut off the streams would certainly suffer and become more unreliable. The conclusion of Mr. Vermeule's interesting paper is as follows:

It will be seen that as to cultivated and forested catchments our gaugings indicate the same total run-off for a given rain-

fall, but a much more uniform discharge, fewer floods and shorter dry periods on the forested areas. Forest streams are consequently more valuable and reliable for power, and for water-supply they require less storage capacity to provide for a given daily draught. The waters are also much less likely to become muddy or otherwise contaminated. The worst condition of all for a catchment is barrenness. Barren earth is non-absorbent. The water soon fails to penetrate it and oxidizes its fertilizing constituents. Heavy rains run over the surface, wash off all the loose materials, and barren conditions once begun perpetuate themselves. There is always danger of such conditions when slopes or other areas unfit for cultivation are deforested, and there is special danger where forest fires are prevalent. There are a few small red sandstone areas in New Jersey now in this condition, where the streams dry up for weeks in succession to become torrents when the rain falls in considerable quantity. Compared with barrenness, cultivation is harmless to the stream. Our end, therefore, should be to keep all ground unfit for cultivation clad with forest.

Cladrastis.

IN 1824 Rafinesque published his *Neogeniton*, a pamphlet of four pages, in which he characterized sixty-six new genera of plants. The first of the list is Cladrastis, proposed to receive the leguminous tree which the elder Michaux had discovered in 1796 and named *Virgilia lutea*. No reference to an earlier publication of Cladrastis is made in the *Neogeniton*, except the general introductory remark that some of the new genera "were indicated last year, 1824, in the catalogue of the Botanic Garden which I have tried in vain to establish in Lexington." Dr. Call, in his exhaustive *Life and Writings of Rafinesque*, recently published by the Filson Club, of Louisville, Kentucky, does not include this catalogue in his list of Rafinesque's writings, and probably it was never published; but in the first volume of the *Cincinnati Literary Gazette*, published in 1824, which has recently come into my hands for the first time, the genus Cladrastis is carefully described on page 66, issued February 21st, and this, therefore, is an earlier publication of the genus by a year than that in the *Neogeniton*, and it is probably the earliest. On the same page of the *Cincinnati Literary Gazette* the species is mentioned as Cladrastis fragrans, which thus becomes another synonym of Cladrastis lutea of Koch, *Virgilia lutea* of Michaux, and Cladrastis tinctoria of Rafinesque in the *Neogeniton*.

C. S. S.

Notes on some Arborescent Willows of North America.—II.

SALIX TAXIFOLIA, H. B. K., southern Arizona, Rillita River (Pringle, 1883), Santa Rita Mountains (Professor Toumey).—A moderate-sized tree, thirty feet in height, with delicate spray, the lower branches drooping. Compared with extreme Mexican forms of the species, for instance Dr. Palmer's specimens (1193) from Colima, there is in the Arizona plant more or less variation in the direction of *Salix longifolia*. But *S. taxifolia*, like other members of the group to which it belongs, is exceedingly variable. The fertile aments in Mr. Pringle's specimens are rather oblong-cylindrical than "sub-globose," and in both the Arizona collections the leaves are larger. Nevertheless, the narrower and longer aments are more than matched by Mr. Brandegee's specimens from Lower California, otherwise characteristic *taxifolia*; and the larger leaves are apparently only the result of a less starved and stunted growth. A form collected by Mr. Pringle "in the valley near Chihuahua" is identical with his Arizona specimens.

SALIX LASIANDRA, Bentham, var. caudata, Sudworth, *Bull. Torrey Bot. Club*, xxii., 43 (1893). *S. lucida*, var. lanceolata, Hooker, *Fl. Bor.-Am.*, ii., 148 (1839). *S. pentandra*, var. caudata, Nutt., *Sylva*, i., 61, t. 18 (1842). *S. Fendleriana*, Andersson, *Proc. Am. Acad.*, iv., 54 (8) (1858). *S. lasiandra*, var. *Fendleriana*, Bebb, Watson & Brewer, *Bot. Cal.*, ii., 84 (1880).

Mr. Sudworth is right; the older name of Nuttall

ought to have been maintained.* In point of fact, however, the oldest name for this Rocky Mountain Willow is *Salix lucida*, var. *lanceolata*, Hook, the type of which in the Kew Herbarium is No. 39 of the "Hooker, Barratt and Torrey" distribution, collected in the Rocky Mountains by Drummond. But *lanceolata* is a homonym, several times over, and, therefore, unavailable, according to the rule maintained by Professor Sargent in the *Silva of North America*.

SALIX FLAVESCENS, Nutt., var. *capreoides* (Andersson). *S. capreoides*, Andersson, *Proc. Am. Acad.*, iv, 60 (14). *S. flavescens*, var. *Scouleriana*, Bebb, *Watson & Brewer, Bot. Cal.*, ii, 86. *S. brachystachys*, Bentham, var. *Scouleriana*, forma *crassijulis*, Andersson, DC., *Prod. xvi.*, part ii, 224. *S. Scouleriana*, Barratt, sec. Hooker, *Fl. Boreali-Americanæ*, ii, 145 in part.—The old name of the *Flora Boreali-Americanæ* was discarded by Andersson because he found that the type specimens in the Hookerian herbarium consisted of flowers of *Salix flavescens* and leaves of *S. Sitchensis* "glued to the same sheet." *S. Scouleriana* thus becomes a synonym of both these species in part, and, therefore, is not available for a specific name. For the same reason it cannot be used for a varietal name. We, therefore, fall back upon *S. capreoides*, Andersson, as next in point of date. In its restricted form this does not well represent the variety of our north-west coast in its widest departure from the Rocky Mountain type, but it is unquestionably a synonym of a so-called *Scouleriana*, and later was so regarded by Andersson himself.

SALIX MISSOURIENSIS, n. sp. *S. cordata*, Muhlenberg, var. *vestita*, Andersson, Monog. Sal. 159, and DC., *Prod. xvi.*, part ii, 252. Fort Osage on the Missouri River (Neuwild ex Andersson).—A symmetrical tree with a slender top, thirty or forty, or even fifty, feet in height, trunk ten or twelve, rarely eighteen, inches in diameter. One-year-old twigs stout, tomentose; leaves lanceolate or ob lanceolate, five to six inches long, from one to one and a half inches wide, cuspidate-acuminate, narrowed from above the middle toward the acute or rounded (but not truncate or cordate) base, at first more or less clothed with silky hairs, soon smooth and dark green above, except the downy midrib paler, but not glaucous beneath, margin glandular-serrate; petioles downy, half an inch long, stipules large, semi-cordate and pointed, or more rarely reniform, obtuse; aments appearing before the leaves, sessile, densely flowered, the male oblong-cylindrical, one and a half to two inches long, half an inch thick, the fertile lengthening to three inches and becoming more or less lax; scales (relatively) large and very conspicuously invested with long, straight, silvery hairs; capsules glabrous, rostrate from a thick base, pedicel (relatively) short, three times the length of the gland and not exceeding the scale; style medium, stigmas minute, entire. The name *vestita*, being preoccupied, is changed to one indicative of the habitat of the species, which, so far as known, does not extend beyond the banks of the Missouri. "The aments usually open about the first of February and have passed out of bloom by March 1st, whereas those of *Salix cordata* do not appear till the first week in April." (Bush.) For one of the *Cordatae*, the extraordinary height and size of trunk attained by this Willow, the repeated durability of the wood for fence-posts, its early period of flowering, together with the technical characters above given, would seem to amply warrant its elevation to the rank of a valid species. At all events, as such, it is much more likely to receive that further study and criticism which will determine its true status, than if left as a doubtful variety within the limits of such a

polymorphous species as *S. cordata*. The sessile, thick, very silky pistillate aments, before expansion, resemble those of *S. discolor*.

Salix Missouriensis has been mixed up with the so-called "Diamond Willow" of the upper Missouri, but is there any reliable evidence of any connection whatever between the two? Several years ago Professor L. F. Ward collected leaves of the "Diamond Willow," which are those of genuine *S. cordata*. A section of the stem, showing the peculiar arrest of wood-growth at the base of the atrophied twigs, taken at the same time and measuring two inches in diameter, indicates an annual wood-growth of one-twentieth of an inch. We may readily see how the heart-wood in such a case might have a closeness of fibre "equal to Red Cedar"; but of all the members of the cordate group, *S. Missouriensis*, with its remarkable vegetative vigor, would be the last that would be suspected of growing two inches in diameter in twenty years! Has a stick of "Diamond Willow," with the "diamonds" on it, so there could be no mistake, ever been seen large enough for a fence-post? After all the attention directed to this "Diamond Willow" more than fifteen years ago, and the widespread interest which was manifested at the time in a matter which, as set forth, seemed to present important economic considerations, it is, indeed, strange that the intervening years have yielded so little in the way of verified knowledge of the facts.

Rockford, Ill.

M. S. Bebb.

Foreign Correspondence.

London Letter.

NOT only was the display at this week's meeting of the Royal Horticultural Society large and brilliant, but many novelties were shown, notwithstanding that this is the dull season when every one who can get away is out of town. A great gathering like that on Tuesday indicates how active is the interest in horticulture here since it can induce so many amateurs and professional growers to devote a day each fortnight for the admiration of the new and rare plants that have come into season since the preceding meeting.

The brilliancy of the exhibition was chiefly due to the magnificent array of Gladioli, new hybrid Cannas, Dahlias and the finest types of hardy perennials. Kelway's display of Gladioli was finer than I have seen for years, owing, perhaps, to the exceptionally warm early summer or to the excessive rains during the past month. There were no fewer than fourteen dozen flower-spikes, the majority fully eighteen inches long. Many new seedlings were exhibited for certificates. None of these showed any decided break from the usual range of colors, less, indeed, than might be expected, since attempts have been made to intercross the novel and strange tints in Lemoine's race of Gladioli with those of the older Gandavensis race. The most striking variation in the new kinds seemed to be those which have resulted from crossing the wide-open flowering *G. Saundersi* with the best of the old *Gandavensis* type. Some of these were recognized by the committee as an advance upon old sorts. These *Saundersi* hybrids could readily be distinguished by the much more open and larger flowers, the recurring lateral sepals and downward tendency of the upper sepal, which characterizes in a marked way the typical species. The color also is, as a rule, more intensely scarlet, with a paler centre. The sorts certificate were named *Kate Rose*, pale rose tint, penciled with crimson; *Brantford*; intensely deep crimson, the darkest tint yet seen; *Dalops*, deep crimson flaked with a deeper hue. Other extremely fine sorts were *Opiter*, *Gildo*, *Cœrus*, *Olius* and *Dunora*. There is certainly not another class in the whole range of cultivated plants that can make so brilliant a display as Gladioli. It is to be regretted that they are so capricious under cultivation and can only be grown to perfection where the conditions exactly suit them

* The work on the Willows of California, undertaken at the request of Dr. Watson, was almost the beginning of my special study of our western Willows. In those days I was just a bit overawed by high authority, nor did I know then, as I came to know later on, how prone Professor Andersson was to minimize, if not to altogether ignore, the work of Nuttall, or I would have seen the propriety of reinstating Nuttall's name.

as regards soil and climate, and in the open air, for they cannot be grown well under glass.

Dahlias made quite a show, the tendency of the popular taste being for new kinds of the Cactus-flowered race. The true Cactus-flowered Dahlias are certainly exquisite flowers, and this season there are fewer spurious Cactus-flowered kinds and more of the true Juarez type, with long, narrow-quilled florets that radiate inward instead of recurving. The colors of some of the new Cactus sorts are splendid and quite unlike the shades commonly seen in flowers of the other classes. We have now a pure yellow Juarez in J. N. Roach, a pure white in Mrs. Peart, a delicate salmon pink in Miss I. Cannell, a deeper scarlet than Juarez itself in Mrs. Burke and Glorious, while in Mrs. Cannell we have an indescribable tint like the nankeen color of *Lilium testaceum*. Mr. Turner's new Cactus sorts are of magenta tones; of these the best shown are Leonora and Beatrice, with Atalanta as an exquisite blush, and Mrs. Turner a finer flower than the yellow J. N. Roach. I noticed last week at the great exhibition at the Crystal Palace that Cactus varieties outnumbered the others something like ten to one, and those of the lumpy show kinds of our boyhood days were scarce.

The Cannas were from Messrs. Cannell, who are among the principal growers and introducers of these increasingly popular plants from the French and German cultivators. There were numerous new varieties shown, but none of this year's novelties, in my opinion, eclipse some of the older kinds, though a few show original markings and combinations of colors. Those worthy of special note were Colibri, pale canary-yellow, with a blotch of deep crimson in the centre—this is quite distinct in color; Quasmoda, vivid scarlet, broad petals sharply edged with yellow; Beauté Poitevine, brilliant scarlet and large; Aurore, very large flower, glowing scarlet; Madame de l'Aigle, scarlet, with yellow edge, in the way of the German Königin Charlotte; Sunset Glow, orange-scarlet, yellow edge. These are all first-rate Cannas, but I do not see that such fine sorts as Madame Crozy and Star of Ninety-one are eclipsed in their particular colors by the new kinds. This has been, one would think, a favorable season for open-air culture of Cannas, but the best I have seen are not to be compared in growth and flowers with those I have seen in the United States, or in India during the winter season, when they bloom continuously for four months if the seeds are constantly picked off. In England I fear we shall always have to grow these beautiful plants under glass.

Orchids were plentiful, and, besides some old favorites shown as good examples of cultivation, there were several new hybrids from some choice collections. From Mr. Ingram there was a remarkable hybrid between *Laelia Turneri Elsteadensis* and *Cattleya maxima Peruviana*, named *Laelio-Cattleya Charles Darwin*. The features of both parents are distinctly recognized in the progeny. The form is more like that of the *Laelia*, as the sepals stand out rigidly at an acute angle and are deep plum-purple color, while the lip is as broad as in *Cattleya maxima*, of an intensely rich amethyst tint, crumpled at the margins, with yellow centre. It is a superb plant. Another hybrid from the same collection was *Cattleya Elstead Gem*, between *C. bicolor* and *C. xanthina*. The flowers are of medium size, with clear yellow sepals, crimson labellum and white centre, a striking harmony of tints. Mr. Statter's group was remarkable for the rare *C. callistoglossa*, a cross between *Laelia purpurata* and *Cattleya gigas*. *C. Rex* recalled a fine form of *C. Mendeli*, the lip having the same form and color and being exquisitely fringed with white. *Laelia elegans Oweniae* is probably the finest variety yet seen; the sepals are of a much deeper color than those of *Turneri* or *prasiata*. It was unanimously awarded a certificate.

Sir Trevor Lawrence showed the rare *Catasetum Bungei*, the large flowers of pure ivory-white borne on a spike a foot long. The heart-shaped lip is two inches across, with a conspicuous blotch of orange-red in the

centre. He also showed such rarities as *Pachystoma Thompsoniana*, *Odontoglossum Kramerii* and *Cypripedium Morganiae Burfordiensis*, which is regarded as better in every respect than the original hybrid named in honor of Mrs. Morgan. It is, in my estimation, even finer than its exceedingly rare parent, *C. Stonei platycœnium*. Messrs. Veitch's large contribution of Orchids included, among the more noteworthy, specimens of *Cœlogyne Veitchii*, with elegant spikes of fine white flowers. This is a valuable addition to the genus, and was considered worthy of a certificate. The white *Cattleya Eldorado*, which has only a blotch of yellow in the throat to mar its purity, is as rare as it is beautiful. Some additions to the apparently never-ending novelties among hybrid Cypripediums also came from Messrs. Veitch. *C. Warnhamense*, between *C. Curtisi* and *C. Philippinense*, was the chief attraction, as it is a cross between the uniflorous and the multiflorous sections, but it most resembles *C. Curtisi*. *Cattleya Dowiana* and its variety *aurea* have just come into bloom, and some splendid examples of the hybrids were shown that have been obtained from them. The variety named *Mrs. Hardy* is one of the most gorgeous Orchids I have seen. It is best described as a pale *C. aurea*, the sepals being almost white. *C. aurea Statteriana*, on the other hand, has the labellum nearly wholly of a bright yellow, with only a few markings of crimson. The Orchids shown as examples of culture included a magnificent *Vanda cœrulea* with eight spikes. It represented the largest-flowered variety with those singular checkered sepals that are only met with in such forms as *Burfordiana*. This was shown by Mr. Woodall, who also exhibited a specimen of *Odontoglossum coronarium*, one of the mountain species that are so difficult to manage and are rarely seen in flower. It has a large cylindrical spike of flowers of the richest yellow and chestnut-brown. It is grown in the coolest house, and very moist, under conditions suited to the *Masdevallias* of the *Chimera* type. It is kept constantly saturated. There was nothing so attractive in Messrs. Sanders' large group as the charming *Habenaria carnea* and its pure white variety *nivosa*. It is a dwarf terrestrial species with erect spikes and broad heart-shaped lips. The delicacy of tint in the variety *carnea* has no equal even among the multitude of Orchids.

Kew.

W. Goldring.

New or Little-known Plants.

Litsea geniculata.

THIS pretty plant is of particular interest to American botanists as the only representative in the flora of the United States of a large genus otherwise, with the exception of five or six Mexican species, confined to tropical continental Asia, the Malayan Archipelago, China, Japan, Australia, New Zealand and New Caledonia. It is a deciduous-leaved shrub with slender stems, often ten or twelve feet high, spreading branches, and thin zigzag branchlets. The small yellow flowers are borne in few-flowered umbellate heads surrounded by involucres of from two to four leaves, and appear in February before the leaves, which are oblong, acute, thick and coriaceous, dark green on the upper surface, yellow-green on the lower, and rather less than an inch long. The fruit, which ripens in the early summer, is globose, bright red, and about a quarter of an inch in diameter; its structure, as well as that of the flowers, is shown in our illustration on page 375 of this issue, from a drawing made by Mr. Faxon from material furnished by Dr. J. H. Mellichamp, of Bluffton, South Carolina.

Litsea geniculata is distributed from southern Virginia to Florida, where it grows in swamps in the immediate neighborhood of the coast. Although a rare plant, the Pond Spice, the name by which this shrub is generally known, was discovered before the middle of the last century. It was introduced before 1810 into Fraser's nursery at Sloane Square, in London, where it flowered in that year; and an excellent

figure made from this cultivated specimen was published in *The Botanical Magazine* two years later (xxxv., t. 1471). It probably will not be found now outside its native swamps.

The very complicated synonymy of the Pond Spice is displayed on page 276 of Mez's *Monographia Lauraceæ Americanæ* in the fifth volume of the *Jahrbuch des Königlichen Botanischen Gartens und des Botanischen Museums zu Berlin*.

C. S. S.

Plant Notes.

NYSSA SYLVATICA.—The Tupelo, or Pepperidge, as it now appears in Central Park and on some of the rugged slopes in the northern parts of Manhattan Island, is certainly one

Tennessee it attains its largest size on elevated slopes. Some of the trees in Central Park carry their branches in horizontal strata around the central stem; in others these branches droop at the extremities, while others still form close, round-headed tops; but all of them are graceful. Already there are branches here and there on which the leaves begin to glow with the scarlet which will make them in a few weeks rivals of the Sweet Gum and the Flowering Dogwood. It is almost useless to attempt to transplant large trees of this species from the woods, but the seeds germinate readily, and if often shifted in nursery rows, young trees can be moved without difficulty.

RUDBECKIA SUBTOMENTOSA.—This is one of the very best of the tall composites which are so interesting at this sea-



Fig. 52.—*Litsea geniculata*.—See page 374.

1. A flowering branch of the staminate plant, natural size. 2. A flowering branch of the pistillate plant, natural size. 3. A flower-bud, enlarged. 4. An umbel of flowers with its involucle, enlarged. 5. A staminate flower, enlarged. 6. A stamen of the inner rank with its glands, front view, enlarged. 7. A stamen of the outer ranks, front view, enlarged. 8. A pistillate flower, enlarged. 9 and 10. Staminodia of the pistillate flower, enlarged. 11. A fruiting branch, natural size. 12. Vertical section of a fruit, enlarged. 13. A nut, enlarged.

of the most picturesque and distinct of our native trees. We have already figured this tree in a group (vol. iii., p. 490) and as a single specimen (vol. vii., p. 275), and have described it so frequently that there is little to add here, beyond calling attention again to its singularly clean, dark green and glossy foliage in the summer, its fiery colors in autumn, and its ever-graceful and individual habit. Like many other trees which grow naturally in damp soil, it flourishes well on uplands, especially where the soil is warm and rich. Indeed, in the mountains of Carolina and

son of the year. It is a plant of branching habit which grows four feet high, and its bright yellow flowers are produced in large numbers and for a long time. It is the best of the larger Cone flowers, and if it can have a good stiff soil in full sunlight it will always make a striking and showy plant. The cones are dark brown and hemispherical, and the florets are a bright yellow, about an inch long, and being rather narrow they are quite separate and give the flowers a very distinct and interesting appearance. Of course, there are many other excellent Cone flowers. Rud-

beckia speciosa, which grows to a height of two or three feet and bears flowers three inches across, is especially good. *R. lacinata* is one of the taller kinds and is quite desirable.

BILLBERGIA RHODO-CYANEA.—Many plants belonging to the Bromeliaceæ are exquisitely beautiful, but few or none of them excel this rare free-flowering species. Side by side with some of the most beautiful Orchids it easily holds its own. The harmonious combination of its delicate tints, its bold habit, its regular and finely marked foliage, render it a thing of real beauty. The flowers are two inches long in close, bracted heads, clear-blue in the bud, and lilac when open. The petals are twice as long as the delicately rose-colored sepals; the style and anthers white; the lanceolate bracts, with recurved spiny edges, about two inches and a half long, beautifully rose-colored; the peduncle ten to twelve inches high, green, and clothed with whitish wool; the leaves eight to ten in a rosette, broad, lingulate, with a sharp spiny point, edged on the upper half with black spines, and on the lower half suffused with blackish purple, and on the outside transversely lined and spotted with white puberulent markings. This species, like all Billbergias, grows well in a compost of fibrous peat and sphagnum in wooden baskets or well-drained pots. Frequent watering with liquid-manure helps the growth, and pieces of cow-manure in the compost are almost equally good. The soil should be kept constantly moist, and frequent syrings are needed in summer. After flowering, the growth generally dies more or less slowly; it may keep beautiful for some time after, but never increases in size. At the base of the growth, which, after flowering and fruiting, has fulfilled its purpose, several young growths appear and soon develop to normal size if the root is healthy; these may be taken off and used for propagation. They should be potted in the usual compost, kept warm and shady and moderately watered. Partial shade is always necessary, and from seventy to eighty degrees, Fahrenheit, is a suitable temperature.

HIBISCUS COOPERII TRICOLOR.—While the typical Hibiscus Cooperii sometimes loses the mottled color of its leaves, which gives the plant its ornamental value, this highly colored variety is quite constant and also more beautiful both in habit and in color. The leaves are ovate-lanceolate, with irregularly and coarsely serrated edges. The color is very vivid, especially in the young leaves, dull green, splashed with pure white, and edged with crimson. The habit is very neat and compact, and if well grown there are few better plants for table decoration. It is propagated by cuttings, like ordinary forms of *Hibiscus rosa-sinensis*. The soil, to develop the highest possible color, should be very rich and the position a sunny one. During the summer watering should be abundant, while a partial rest during winter is beneficial. Young, not too large, plants are the best in every way.

THUNBERGIA (MEYENIA) ERECTA.—This very floriferous, ever-blooming Thunbergia is not a climber, as are most other species. It is a stiff, erect-growing shrub, said to attain a height of six or more feet in its native country. The opposite ovate-lanceolate leaves are two to three inches long. The flowers are borne singly from the axils of the leaves and are about three inches long, with an inflated, curved tube and five large orbicular segments of equal size. The corolla is fully an inch and a half across, and the calyx consists of ten to twelve acicular segments half an inch long, and the two-leaved epicalyx larger than the calyx and enclosing it. The color is a deep bluish purple, with an orange throat. Plants will flower quite freely, even when only a few inches high. Ordinary greenhouse treatment is sufficient. This is a promising plant for window-gardening where a bright and airy position can be had.

SOLANUM AZUREUM.—Though nearly related to *Solanum jasminoides*, this plant is quite distinct in the color of its sky-blue flowers and in the shape of its leaves. It might, perhaps, be considered only a form of that well-known species in which the leaves and panicles of flowers are considerably smaller. The leaves of the plant are pinnately

divided, with from five to seven, rarely nine, ovate segments. The loose, subaxillary panicles produce from twenty to thirty blue flowers with large yellow anthers. The leafy, slender stems grow to a considerable length and are of a bluish-green color. Like *S. jasminoides*, this plant is a very profuse bloomer and will do well under the same treatment. Side by side the two make a pleasing contrast, and both are well adapted to growing in vases, as well as on trellises and verandas, during the summer months.

Cultural Department.

Native Composites.

WHILE it is true that exotic plants are generally most appreciated in gardens, this is not always because they are more beautiful than native flowers. That the latter are not more commonly grown is often owing to the attempt to collect the supposedly rarer foreign plants and to the prevailing lack of observation which causes us to overlook the good points of our wildlings. The reaction of the last few years in the direction of greater simplicity and naturalness has had the happy effect of introducing many yellow native composites into cultivation. Many gardens are now rich with Sunflowers, the best of which are unexcelled at this season as showy, attractive objects. These, with the yellow Cone flowers and Silphiums, make a large class of invaluable plants to brighten up the garden at this season. But there is another group of plants whose merits are slightly appreciated in our gardens as yet, although they are typical American plants over which considerable glamour of sentiment and poetry has been thrown. The Asters or Starworts, while not flaunting and showy as the Sunflowers, are highly ornamental and desirable in the less formal parts of the garden. While Asters are perfectly hardy and will apparently exist under almost any conditions, they repay even a little care, and improve amazingly under cultivation, forming usually thrifty bushes covered with a multitude of star-like flowers, a condition in which they are seldom seen in the fields. As is well known, there are many species of Asters. They are difficult plants to determine botanically, and as they cross freely, outside of a few well-defined forms it is not easy to know the various kinds. The nomenclature is consequently much confused—at least, in gardens. Professor Gray made the subject his own, and cleared up many difficulties, but since his death there seems to be no recognized authority except his herbarium specimens. These flowers have long been great favorites in English gardens, and the names had become so confused that a few years since an endeavor was made to clear the nomenclature by growing specimens of all available kinds in the Chiswick garden of the Royal Horticultural Society. The plants were studied by botanists and gardeners, the species separated from the hybrids, and all determined and named according to the best knowledge available. I do not know of any large or nearly complete collection in the United States. If one had the space for them they would offer a most attractive field for collection and cultivation, and one would, besides, be doing a public service. Such a contract is entirely too large for my small garden, though I have two dozen kinds named at Chiswick, as a nucleus of what was intended to be a complete collection for comparison. However, if one only desired a few kinds for ornaments, a collection of a dozen kinds would be sufficient. *Aster ericoides* has hundreds of small white flowers. Medium white flowers may be found in forms of *A. Novi-Belgii* and *A. versicolor*, the latter changing to light mauve. But none of the medium-sized white-flowered Asters are as handsome and pure in color as those of the allied *Boltonia*. At Mr. Manda's the other day *Boltonia asteroides*, growing in a group of Asters, stood out boldly and distinctly among the other plants, and the purity of color was noticeable at a great distance. *A. longifolius* Lady Trevilyan, is the best large-flowered white Aster.

The best lavender or mauve colored kinds are forms of *Aster laevis*. Of the darker kinds our dark purple *A. Novæ-Angliæ* is too common to need description. The rose-colored forms, however, are much handsomer, *A. roseus* having flowers of equal diameter with fewer rays of a clear rosy shade. *A. ruber* is a smaller flower with numerous rays and of a darker rose shade.

There is a great difference in the habits of the different Asters, some being sparingly branched and some densely furnished; some are dwarf, others very tall. There also is a difference in the closing habit of the flowers. *A. Novæ-Angliæ* seems to close the earliest and closest in the evening, and some of the others do not close at all.

Elizabeth, N. J.

J. N. Gerard.

Chrysanthemums.

SPECIMEN plants should have completed their growth by this time. Until now our object has been to develop as many growing shoots as possible; after this the plants will need to be tied into shape by a proper distribution of the shoots, always guiding the strongest toward the centre. This work should be done at once, so that the plants may lose some of the characteristic stiffness which comes from training. These instructions apply to trained specimens; plants which have been allowed to grow naturally will, of course, be considerably taller and irregular in outline, and to many persons such plants have a greater charm. But even these need some tying, which should be done neatly, and the stakes hidden as much as possible. As with trained specimens, the stake should take as much as possible the line of the growing shoot, and always be placed behind it and topped to the last tie. A heavy stake, longer than is required for support, should not be used with a slim shoot. While this work is going on the earliest varieties will be showing their flower-buds. Disbudding should be commenced at once and continued every day. Not all the buds can be taken off at once, but the work should proceed gradually, and the last one be removed only when it is certain that the bud we need is perfect in form and is taking the lead in growth. I have noticed a tendency in some varieties, more especially in I. Delaux, G. Daniels, Arethusa, Amber Gem, and this year's novelty, Chrystallina (Vaughan), to show crown-buds at taking time. As this occurs well into September, I always take them. If they were removed, terminals would appear, but so late in the season that it is questionable whether they would develop flowers of as good quality as the crowns. I would advise the retention of all crown-buds appearing on specimen plants in September.

Feeding should be continued until the blooms begin to show color, but less frequently and in less quantity. One guide in regulating the use of stimulants, in addition to noting the general effect on the plant, is to observe whether new roots appear on the surface of the soil. Whenever they do we can be certain that the food has been properly given and is doing good work. If no roots appear, little can be done to remedy the mistake of overfeeding. If the mistake is made of giving an overdose of guano the pot should be immersed to the rim in a tub of clear water. This treatment will act as a dilutant. Some damage will result, and a loss of leaves follow, but we may still preserve the plant in presentable shape. If, however, the effects are gradual, it is probable the bad results will not be discovered until it is too late to remedy the trouble. In this case we let the plants become as dry as possible without wilting, and give clear water only when moisture is needed.

The plants should be housed by the first of September. They can be left out-of-doors longer, but nothing is gained by the delay. They are better under cover, and from the first of October onwards will be benefited by keeping the air dry at night. This prevents damping and mildew. It is necessary to admit an abundance of air, but draughts must be guarded against.

Plants intended for specimen flowers will be showing crown-buds and terminals in all gradations. It is difficult always to exactly define these buds. Crown-buds are always bracteate, but there are so many degrees of development that it is difficult to tell, for instance, what we know as a second crown from a true terminal. The second crown is a valuable bud on which a large number of varieties do better, if anything, than on terminals. The terminal, or last bud, is the safest always when we are in doubt. It may lack size, and sometimes depth, but it always shows the best color, and the stem is sure to be well clothed with foliage. A second crown-bud on such varieties as William Seward, J. Shrimpton, G. W. Childs, Domination and Inter-Ocean will always give a show flower of great depth. E. Dailedouze is better on a terminal. So we might go on. Experience is the best guide. What is essential is to know which bud is best for our purpose and make a note of the fact.

T. D. Hatfield.
Wellesley, Mass.

The Grapes of the Year.

FROM a collection of more than eighty sorts I should select the following as indispensables, for everybody: Brighton, Niagara, Worden—one red, one white, one black. But I should wish to add Herbert black, Hayes white, and Lindley red. Lindley, however, is very long-jointed for a good vineyard grower, and requires too much room. The two best very early Grapes are Moore's Early and Green Mountain. Diamond, contrary to expectations, is not an early grape to be

relied on. It ripens sometimes in August, and again all along through September. It is every way freaky. Vergennes is another exceedingly useful red grape. Its quality is not highest, and it has a very thick skin. Gaertner is a red grape that should be graded very high. It is among the earliest. For late keepers I select Diana and Pocklington, both enormously prolific, and both of a peculiar musky flavor, but fine. The bunches are very compact and heavy. For choice grapes worth extra care and winter protection, I cannot afford to dispense with Iona, Goethe or Dutchess. The latter is early and a poor keeper; the two former are excellent keepers. Jefferson will not ripen here oftener than one year out of ten. For training against barns and outbuildings I know no better Grape than August Giant. It is really excellent in quality, and for growth has no rival. For home use it may be added to the three indispensables for the table—Brighton, Worden and Niagara. As Brighton is a bad self-pollinator, it must invariably be grown alternately with Niagara or Worden or other Grapes.

Thoroughly good grapes can only be grown in a warm, open exposure. Trellises should, if possible, run north and south. A swale facing south-east, with rich, loose clay soil, is most satisfactory. When the exposure is bad there is delay in fully ripening at the proper date, but the leaves at that time begin to fail in elaborating the sap, and consequently the grapes never become quite perfect. I have learned the need of hastening the ripening of our grapes. Lindley trained against my barn is ripe two weeks earlier than on a trellis that is slightly shaded, and the quality is incomparably better. No grape grower can ever afford to be without Bordeaux mixture. I have invariably applied it of late with kerosene emulsion. In fact, I have learned to use the emulsion with all sprays, on all sorts of vegetation.

A peculiar feature of grape-culture for this season has been that along the whole Grape-belt a severe freeze in May destroyed the whole new growth, including all the buds and blossoms. But the very severity of the cold led to an entirely new growth from dormant buds, and from this a fairly good crop of grapes has resulted. What is also surprising is that this secondary crop has ripened considerably earlier than any grape crop in twenty years.

E. P. Powell.

The Vegetable Garden.

THE weather has been so unseasonably warm that we are apt to forget that cool nights are due, and a sudden frost may come as a surprise north of New York any time after the middle of September. Celery will not be making its best growth until the temperature at night is comparatively low, but it will whiten much more rapidly in the latter part of September than it will in late autumn. The plants which are required for early use should have a little finely pulverized soil drawn about them once a fortnight, although, of course, it is too early to earth up the main crop. Of course, Celery should never be handled while it is wet with rain or dew. The rusted leaves should be picked off as they appear, the ground should be kept clean, and the plants should never be allowed to lack water.

Lettuce can be sowed in the open ground and pricked out in cold frames, but it will not always mature before frost. In open autumns, if the ground is kept clean, plants will head in November, and the rest of them in winter. Of course, sashes should not be used before heavy frost, except to protect the plants from beating rains.

In warm beds with a southern slope Spinach, if sown now, may furnish a few plants for use before winter, but in any case it will be good for spring use. The round-seeded variety is rather more prolific than the prickly-seeded, but it needs more protection.

Cut off the Asparagus as soon as it begins to turn yellow, and before the seeds fall to make bad weeds next year. The tops ought to be burned, as this will in some degree discourage the attacks of the beetles.

Where the larger kinds of Cabbage begin to burst, the roots should be loosened with a fork, and all Cabbage and Cauliflower which is still making any growth should be frequently hoed. If freezing weather catches the Cauliflowers before they have made full-sized hearts, they can be kept for winter use by heeling them in closely in cold frames.

If plants of Water Cress are set in a frame now, and the soil is kept damp, they will begin to make a new growth. If the frames are carefully banked up so as to exclude the frost they will furnish a much-prized relish in winter.

Montclair, N.J.

R. A.

Asparagus Sprenglei.—This plant, as well as *Asparagus decumbens*, can be grown to excellent advantage in hanging baskets for stoves and greenhouses, and even for veranda decoration in the summer months. In high-roofed stoves, especially where the plants in them are not tall enough to fill up the space, both these species will be found very useful. The former makes growths sometimes six feet long, beautifully branched and hanging naturally over the sides of the basket. The leaves are comparatively large and bright green in color. If in a healthy condition the plants will produce at least two crops of flowers each season, and the flowers are very attractive, being almost pure white and arranged in short racemes. *A. decumbens* is much smaller than *A. Sprenglei*, but none the less attractive, the stems being closely branched. Both plants are easily increased, either from seed or by division of the crowns.

Botanic Garden, Washington, D. C.

G. W. O.

Variation in Corn.—In observing several varieties of Corn last year it was noticed that in the same variety there was a marked variation in the number of rows upon the ear. For example, in the kind known as Portland we found ears having eight, ten, twelve, fourteen and sixteen rows. It was not till late in the season that this variation was noticed, and, therefore, extended observation could not be made to determine the prevalence of this characteristic in different varieties. This season about a hundred varieties have been examined, and two-thirds or more of these show variation in the number of rows on the ear. We have found two ears on the same stalk, each having a different number of rows. This presents an interesting aspect of variation in cultivated varieties which have been produced from crossing. The many varieties of Sweet Corn have sprung from others which differed originally in the number of their rows, and this fact now appears in most of the cross-bred kinds in the form of row-variation. In other words, while some of the characters of the cultivated crosses seem to be established, so that they are reproduced with reasonable certainty, all the characters are not definitely fixed.

Native Plums.—The following varieties of native Plums are in fruit this summer at the experiment station: Marianna, Wild Goose, Wooten, Quaker, Wayland, Forest Garden, Weaver, Transparent and Golden Beauty. The native Plums are favorites of the curculio, and one to four slugs appear on every fruit. Hardly a trace of the rot is to be seen on these varieties. The Marianna and Wild Goose have already ripened; the Quaker and Wooten are now ripening, and the remaining varieties are green.

Age of Bordeaux Mixture.—It has been shown by Mr. Lode man, of the experiment station, this season, that after the Bordeaux mixture has been prepared a long time it precipitates more rapidly when mixed with water than when newly made, and, therefore, the older it is the more it must be agitated. In applying it to Potato plots for blight, which required one knapsack sprayer of material for each plot, the portions sprayed first are comparatively free from the disease, while those sprayed with the last of the material in each knapsack are as badly affected as the check plots, showing that the Bordeaux quickly precipitated, and was used up in the first delivery from each sprayer. The Bordeaux used in these experiments was made in May. Plots sprayed with the mixture made at the time of each application show that the material was distributed uniformly over the entire plot, for here the blight is evenly checked.

Cornell University.

G. Harold Powell.

Correspondence.

The Sacred Lotus in Egypt.

To the Editor of GARDEN AND FOREST:

Sir,—In the issue of GARDEN AND FOREST for August 21st Mr. Day makes mention of the leaves of *Nelumbium speciosum* from Egyptian catacombs now preserved in the Abbott collection in New York City. I have not seen the collection, which I know by reputation to be a very complete and valuable one, and the fact that specimens of the leaves of the Sacred Lotus exist there is most interesting. As far as I know, neither leaves nor flowers were on exhibition at Giseh when I examined the collection there two years ago and made notes on the spot.

In a review of Dr. Bonavia's *Flora of the Assyrian Monuments* in the same number of GARDEN AND FOREST nothing is said of the chapter dealing with the Lotus. Dr. Bonavia claims that *Nelumbium speciosum* never existed in Egypt, and that the

Rose Lotus was the red variety of the white Lotus, *Nymphaea Lotus*. And the reason he gives for the statement is, that "it is not likely that a plant like the *Nelumbium*, so easily propagated by seed and root, would have disappeared from Egypt had it been there," which statement seems somewhat remarkable in the face of many similar examples of plants which are absolutely known to have flourished in Egypt thirty centuries or more ago, and are now no longer seen there. The Papirus is one instance. The original home of *Cyperus Papryrus* is a matter of question, too, for Boissier claims that it grows spontaneously in tropical Africa, in Abyssinia, Nubia and Syria, having been brought there from Egypt, and from being spontaneous in the latter country it has retreated further south as a result of the change in the Egyptian climate.

It would take too much space to enumerate here the plants which have disappeared from Egypt since Pharaonic times. But, to return to the Sacred Lotus, it would seem as if it had been too well described by classical authors to be questioned, even in this doubting nineteenth century. Theophrastus, Herodotus and Strabo each, and in various ways, describe its rounded, peltate, concave leaves, rose petals and peculiar fruit too plainly; and the fact that still in the far east the statues of the gods stand on *Nelumbium*-shaped pedestals seems to go to prove that through Asia, from time immemorial, the plant has had divine significance, for in the east things do not change rapidly, and the sacred things of yesterday are very apt to be those of to-morrow.

I have not seen any record of the finding of the plant in tombs of Pharaonic periods, and it will be very interesting to learn the "provenance" of the leaves mentioned by Mr. Day. It has been found in the Graeco-Roman Necropolis of Hawara, which would seem to settle the question, as, if it occurred in Egypt then, it could scarcely have been a novelty in the country. But at that time the old Egyptian religion was in its decadence, and the plant had probably lost its sacredness, and may have been put to many uses forbidden in older, orthodox centuries.

The hieroglyphic name of the Sacred Lotus, according to Monsieur Loret,* was Neheb, changing later to Nekheb and Nesheb, and the oldest rendering of it is seen in the funeral texts taken from the pyramid of Pépi I. The name of the White Lotus, *Nymphaea Lotus*, was Soushin, and that of the Blue Lotus, *N. cœrulea*, was Sarpat. The terminal hieroglyphic sign in the rendering of the name, an outline of the flower, is, in the case of the three forms of the name of the Sacred Lotus, the same, and much larger, longer and of an entirely different shape than the one terminating the spelling of the names of the White and Blue Lotus. This also would seem to prove that the plants were radically different, and were known to be different, and also that the similarity of the two Water-lilies was recognized.

The Sacred Lotus was made to serve as the cradle of Horus, the God of the Rising Sun, and to its habit of closing its petals in the evening and often disappearing under water for the night may be attributed the reason of the very important rôle it played in the Egyptian solar myth.

East Hampton, L. I.

Anna Murray Vail.

Air Drainage.

To the Editor of GARDEN AND FOREST:

Sir,—I note with much interest the observations of Dr. Hoskins upon the importance of atmospheric drainage in fruit-culture.

During the last six years I have been so situated in the fruit-growing districts of western New York and upon the prairies of Dakota as to have exceptional opportunities for observing the importance of this almost unheeded element of local climate, and during the growing season of 1894, and again this year, I have noted its influence. In 1894 late spring frosts did considerable injury in districts not well drained aërially, and this season the injuries have been intensified. Frosts have occurred during each of the growing months of the year, and in each case ice has been formed in the draws and valleys, and Corn and Potatoes, while not entirely killed, suffered a severe check, the marks of which are visible until the present time. The more elevated portions escaped with slight injury to these tender plants.

A notable example was presented on the morning of June 28th, when Corn, Potatoes and other tender annuals growing upon the flats along the Sioux River were severely frosted, and as the land rises gradually for some four miles from the river to the experiment station grounds, a gradual lessening of the injury by the frost was noticeable until the station

* *La Flore Pharaonique.*

grounds were reached, where no damage even to Tomato-plants could be detected. These, however, are upon one of the most elevated portions of the prairie in the vicinity, and the land here is not level, but has a gradual descent to the east of about five feet in thirty rods. Other and quite as marked examples of the value of air drainage are afforded by the very slight undulations of the comparatively level prairie. It is not unusual after a late spring frost to see in a Corn-field an area of four to six square rods perceptibly touched by frost, while the remainder of the field is unhurt.

In the grape-growing districts of western New York the limits of the successful cultivation of such valuable varieties as Isabella and Catawba are determined by no greater factor than air drainage. The sections in which these late varieties can be successfully grown are confined to narrow strips bordering the larger inland lakes and rivers. Outside the limits of this area experience has proved that the cultivation of these varieties is unprofitable, because their season of ripening is late, and, therefore, fall frosts are liable to catch the crop yet upon the vines; near the rivers and lakes the ameliorating influence of the water is sufficient to ward off the frost.

In the west this question is of vastly more importance than in New York state, as late spring frosts and early fall frosts are much more frequent, and, although the prairies are comparatively level, slight differences, as of two to ten feet, in elevation often mark the line between success and failure with the tender annuals as well as with fruits. At present it has a more important bearing upon garden annuals than upon fruits, but in order that future fruit interests in these sections shall not suffer from a lack of knowledge of this factor, it is well that every fruit-grower and prospective tree-planter should be informed of its importance.

State Agricultural College, Brookings, S. D.

L. C. Corbett.

Double Sweet Peas.

To the Editor of GARDEN AND FOREST:

Sir,—Several plants obtained from "Eckford's Grand Mixture" of Sweet Peas show a strong inclination to become double. Some simply have the standard deeply lobed, or, in some instances, divided; others show more elaborate modifications. For instance, one has two complete standards side by side; one of these bears at its base a small lobe reversed upon the main part, while opposite the keel is another extra petal-like appendage, terminating in a pollen-bearing anther. The essential organs are apparently normal. Another, which approaches nearer to the ideal, presents one standard partly in front of the other; both are of good size and symmetrical. In the rear of these the calyx has developed an extra sepal almost as long as the standards and as highly colored. The light and dark reds show these variations most plainly, but they are also prominent in a light yellow variety. So many pronounced freaks in a single season seem to indicate that where any variation has once occurred others are likely to follow.

B. L. P.

Harmonsbury, Pa.

Quercus Phellos X rubra in Missouri.

To the Editor of GARDEN AND FOREST:

Sir,—On page 366 of my *Trees, Shrubs and Vines of Missouri*, I have written at some length on this hybrid Oak, the old *Quercus heterophylla* of Michaux, giving my reasons for thinking that it did not occur in Missouri, at least in the previously reported localities. There having been so much obscurity about the parentage of this noted tree, and not feeling certain that Mr. Hollick's combination was any more correct than Dr. Engelmann's, I had about come to the belief that the hybrid was the result of several different crossings and not the offspring of any two certain species, as had been supposed, and hence my doubts expressed as to its occurrence in Missouri.

A slip of the pen in my note on page 366 of the current volume of GARDEN AND FOREST makes me say Red Oak instead of Scarlet Oak, which changes the status of things decidedly, and thereby allows me to show that the hybrid collected is really *Quercus Phellos X rubra*. Having had abundant opportunity to study the Dunklin County tree this season, I can, without hesitation, say that it represents *Q. Phellos X rubra*, and is described as follows: Tree much resembling the Red Oak in trunk, branches and general appearance; branchlets densely tomentose, the density and character of the tomentum being that of *Q. rubra* when young, but soon becoming smooth and polished; buds large and smooth, ovate and pointed, very similar to those of *Q. rubra*, but smaller; leaves heterophyllous, the greater proportion of them being nearly like those of *Q.*

Phellos, with some forked and lobed, very thick, shining above, densely tomentose beneath when young, but becoming nearly smooth in age, with lobes shortly bristle-tipped, the *Q. Phellos* form, which I have indicated as No. 610, having very short petioles, and the *Q. rubra* form, which I have kept separate under No. 610, having slender petioles about one inch in length; fruit much like that of *Q. rubra*, but much smaller, somewhat approaching that of *Q. Phellos* in shape.

Only one tree was found, and this is standing in a piece of low wet woods 200 feet south of the railroad track and about one-half mile east of the station at Campbell. The principal growth here is Oak, of which *Quercus Phellos*, *Q. rubra*, *Q. minor*, *Q. alba* and *Q. velutina* are the only species present, and these occur in abundance in the order given. The trunk is about fifteen inches in diameter three feet above the ground, and the height was estimated at sixty feet. At a distance the tree very much resembles the Willow Oak.

This hybrid differs from *Quercus Phellos* in the forked and lobed leaves, which are tomentose when young, with bristle-tipped lobes and long petioles; the larger and different-shaped fruit, and the larger and different-shaped buds. It differs from *Q. rubra* in the narrow entire leaves, which are very shortly petioled, the smaller and more rounded buds, and the smaller, slightly different-shaped fruit; from *Q. velutina* in the different-shaped fruit, entire leaves with their short petioles, and smaller smooth buds. It is not related to *Q. digitata*, which is common at Campbell, but not seen near the piece of woods where this tree stands; nor to *Q. imbricaria*, which is also found near Campbell, though rarely; nor to *Q. Texana*, which is found on the hills near Chalk Bluff, but not commonly; and there are no other species of Black or Red Oaks in the immediate vicinity of this tree.

The hybrids found in De Kalb, Shelby and Sullivan counties by Broadhead, and in Cooper and Pettis counties by Swallow, are probably derived from *Quercus imbricaria* and *Q. rubra*, and not from the Willow Oak.

Independence, Mo.

B. F. Bush.

Recent Publications.

Mr. J. G. Lemmon, of Oakland, California, has just issued, in convenient form, a *Hand-book of West-American Cone-bearers*, in which he records his observations upon the coniferous trees of western North America, gathered during years of travel in the forests of that part of the country. A view of an ancient Sequoia in the Tuolumne Big Tree Grove serves as a frontispiece to the work, which is further illustrated by a number of photographs of fruiting branches of species of the different genera described. Mr. Lemmon is an acute observer and a most enthusiastic lover of trees, and something of his skill in describing what he has seen appears in his remarks upon the Sugar Pine (*Pinus Lambertiana*), which we reproduce:

The Great Sugar Pine is the accepted, the crowned, prince of the Pine family. Not only by virtue of its unexcelled dimensions and the magnitude of its cones is it regal, but it is a most kingly monarch in its majestic, lofty bearing, its erect, self-asserting dignity, and its bowed head, obedient to its only masters—the powers above. Only the supreme emperor of the whole vegetable world, the immense Sequoia, also a denizen of our great Sierra forest, and admitting the Sugar Pine to fellowship, excels in dimensions (every way but in fruit) this noble, dominant tree of the whole western world.

The *West-American Cone-bearers* is sold by the author at \$1.00 a copy, and is to be followed by a more comprehensive work on the same subject, which will be fully illustrated, and is designed "to present by comprehensive classifications and careful descriptions, both scientific and popular, the latest and most useful information concerning this family of important trees—unparalleled in their abundance in north-west America."

Notes.

The latest of the *Minnesota Botanical Studies*, being Bulletin No. 9, issued by the Geological and Natural History Survey of Minnesota, under the editorship of Professor Conway Macmillan, is devoted to a bibliography of American Algæ, by Josephine E. Tilden.

An expert in California, who has been trying different methods of extracting the odors from flowers, claims that he has

discovered a process by which he can compete successfully with the French distillers of perfumes. The great advantage of the new method is said to be that it extracts the odors from the flowers almost instantaneously, and in this way much time and labor is saved.

Mr. Carman, who has grown the Green Mountain Grape since 1889, writes that the more he sees of it the better he likes it. He pronounces it positively the earliest, and, for its season, the best of our White Grapes. The fruit on the Rural Grounds were ripe on the 20th of August this year. The quality is pure and refreshing, the seeds are small, the skin thin, but firm. The Early Ohio ripens about the same time, but the berries are sour and the flesh tough.

Leycesteria formosa is a shrub found in the higher parts of Nepal and well known in English gardens. It is not hardy in this latitude, but Mr. Joseph Meehan writes to the *Country Gentleman* that, although it gets partly killed back in the winter-time, the young shoots come up every spring and flower in Germantown abundantly from July to November. The plant belongs to the Honeysuckle family, and bears pleasing light pink flowers, whose purple stems and calyxes are also quite attractive.

Mr. B. F. Bush, of Independence, Missouri, has reprinted from the State Horticultural Report of Missouri his *List of the Trees, Shrubs and Vines* of that state. Two hundred and ninety-four species are described, a number which can probably be slightly reduced. *Betula populifolia*, for example, which is admitted doubtfully, probably does not grow anywhere west of the Mississippi River. The list, too, is enlarged by two hybrid Oaks and by our Chestnut, which is not an inhabitant of any part of the region west of the Mississippi.

Mr. C. W. Garfield, in *The Rural New Yorker*, makes the suggestion that the American Pomological Society furnish the Government with a bulletin containing its fruit catalogue with the perfected nomenclature and the distinguishing characters which indicate values for different localities. When it is remembered that the publications of the American Pomological Society are limited in number and published biennially, it seems that the proposed method would be useful in giving a wider circulation to the results of the work done by the Committee on Fruits.

Dr. Franceschi has brought together, in a volume of eighty-eight pages, under the title of *Santa Barbara Exotic Flora, a Handbook of Plants from Foreign Countries Grown at Santa Barbara, California*, a series of articles first contributed by him to the *Santa Barbara Press*. There is probably no better spot in North America for a garden than the coast of southern California, and the number of exotic species that can grow there is very large. Dr. Franceschi's publications will certainly stimulate a taste for gardening in California, and his efforts to enrich the exotic flora of his adopted state will be watched with the greatest interest by all Americans interested in horticulture.

We have received from Meehan's Nurseries specimens of *Cedrela Sinesis* in fruit. It has flowered for several years in this country, but we have never before seen the seed, and should like to know if it has been produced elsewhere. The tree in its general appearance resembles the Ailanthus, and, perhaps, it might be used here to advantage as a street-tree in places where the Ailanthus is objected to on account of the odor of its flowers. The tree is a native of the northern parts of China, and it is not improbable that a strain of the species may yet be established here which will be hardy throughout New England, where it is now rather tender.

We have heretofore given several methods of saving unripened tomatoes which remain on the plants when the first frost comes. On this point, Professor Massey, of the North Carolina Experiment Station, writes that when frost is imminent he gathers the green tomatoes, wraps them separately in paper (old newspapers will answer), and packs them in boxes, which are stored in a place just warm enough to be secure from frost, the object being to keep them and not to ripen them. Then, as the fruits are wanted, a few are brought out at a time and placed in a warm position, where they will ripen in a few days. In this way he has kept his table supplied with sliced tomatoes up to midwinter.

A dispatch from London to *The Sun*, of this city, states that this year there has been such an enormous crop of plums in Great Britain that the price for the fruit has fallen to twopence a pound, which is so little that it does not pay the cost of gathering and freight. One would naturally have supposed that the growers would have made haste to dry the fruit, since

England pays annually two million dollars for dried plums imported from France. English farmers are extremely conservative, however, and they sat still and allowed the fruit to fall on the ground and rot. It may be that these plum-growers can give some reasonable excuse for their failure to meet such an emergency. Farmers and fruit-growers are often accused of a lack of enterprise when in reality it is practically impossible to solve offhand the problems which suddenly confront them.

Professor Lazenby, of the Ohio Experiment Station, in making tests for ascertaining the purity and vitality of seeds, notes the remarkable power of re-germination which is exhibited by various species. Different samples of Wheat germinated no less than ten times after intervals of a week or more, during which time the seeds were kept perfectly dry. Corn will germinate nearly as often. Clover and the grass seeds germinate but once, as a rule. This helps to explain why a good stand of Grass or Clover is difficult to obtain in unfavorable seasons, while failure with Wheat or grain from alternate wet and dry conditions seldom occurs, provided the seed is good. It may also be one reason why certain garden seeds will endure much greater neglect than others.

The Rev. W. T. Hutchins writes to *The Florists' Exchange* that the quality of the newer Sweet Peas is endangered by the enormous production of seed in California and perhaps elsewhere. It is complained that some of the improved types are losing their fine shell-shaped and hooded form and have a narrow, reflexed look, and in this half-deteriorated and washed-out condition they are not as good as the old sorts from which they were originally developed. The reason for this is that proper care has not been taken to hold the plants up to a rigid standard. In order to retain the highest quality something more is needed than merely pulling out the rogues or plants which show a bad color. Every single plant which shows any deterioration should be removed, or else the best of the varieties will revert to ancestral types. Of course, such rigorous care cannot be exercised where seed is sold at present prices, but, unless the seed is grown distinctly for quality rather than for quantity, the deterioration of flowers is sure to follow.

In the markets, cranberries, crab-apples, quinces and small yellow tomatoes, for preserving, indicate the autumn season in fruits, although all the middle and late summer fruits and vegetables are yet fairly represented. Lemons still command unusually high prices, notwithstanding the drop of forty to fifty degrees in temperature since the middle of last week. The supply of this year's crop from the Mediterranean for the remainder of the season is said to be only one-third of the quantity imported for the same term a year ago, and choice Majori fruit during the past week sold for \$8.25 a box at wholesale. With the last California seedling oranges, brought out of cold storage, now appear the earliest Jamaica oranges, the first large shipment of which fruit is due here to-day. Flame Tokay grapes, with a fine lilac-bloom on the red skin, and large Kelsey plums, with their different shades of mingled purple and yellow, were among the showiest California fruits of the fifty-two car-loads sold in this city last week. Some Purple Damascus grapes are also now coming from the western coast, with the long-berried Black Cornichons and Rose of Peru. George's Late Cling is one of the varieties of peaches most frequently seen now, a large white-fleshed fruit, the yellow skin striped and splashed with bright red, and said to be among the most profitable kinds grown in California. Picquet's Late, a free-stone, introduced from Georgia, is another good sort now coming from the west. The preference is, however, for eastern-grown peaches, even though these are small and unattractive in appearance.

Charles V. Riley, the well-known entomologist, died in Washington on Saturday night from injuries received in a fall from a bicycle. He was born in London in 1843, came to this country at the age of seventeen years and settled on a farm in Illinois. He served as a soldier in the last years of the war, and after some experience in journalism he was made state entomologist of Missouri, which position he filled for nearly ten years. His work in that state attracted much attention, and in 1878 he came to Washington, where, until last year, when he resigned his position, he has practically supervised all the entomological work carried on by the Government. Mr. Riley was a tireless worker, with an aptitude for original research, and many of his published papers are of permanent value. He had a talent, too, for political management, and for many years he was recognized in the Department of Agriculture as one of the forces in directing its policy and selecting its agents.

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLES: —Landscape Art in the Military Parks.....	381
Germany's Forestry Policy.....	382
Notes on Western New York Woodlands.—II.....	R. E. J. Hill 382
Autumnal Changes in Leaves.—I.....	Justus Watson Folsom 383
NEW OR LITTLE-KNOWN PLANTS: —Agave Utahensis. (With figure.).....	384
PLANT NOTES:	384
CULTURAL DEPARTMENT: —Gardening in North Carolina. Professor W. P. Massey.....	385
Bulbous Plants.....	J. N. Gerard 386
Flower garden Notes.....	W. N. Craig 387
Two Good Grapes.....	E. P. Powell 387
Solanum Wendlandi.....	E. O. Orpet 387
Keeping Pears, Plant a few Winter Pears.....	Edwin C. Powell 388
CORRESPONDENCE: —What Shall We Do with the Birds? Professor Fred W. Card.....	388
Notes from Santa Barbara.....	F. Franceschi 388
Notes from the South-west.....	Lora S. I. Mace 389
Rhizus Poisoning.....	R. A. 390
Myrosma cannaefolia (Calathea myrosma).....	J. N. Gerret 390
RECENT PUBLICATIONS	391
NOTES	391
ILLUSTRATION: —Agave Utahensis, Fig. 53.....	393

Landscape Art in the Military Parks.

LAST week we spoke approvingly of some suggestions in *The Century* in regard to the construction and administration of the great national military parks which have been lately acquired by the Government. The first of these suggestions was that "Every commission should avail itself of the advice of the best landscape-architects so that park-like effects may be retained as far as may be consonant with the more practical objects of the reservation." One of our correspondents expresses strenuous dissent from this recommendation. He says that the idea of decorating a battlefield with garden finery is altogether repugnant to his feelings, and he adds that the work of the gardener is too petty to be tolerated in a place like this, where the grandeur of the natural scenery is more than matched by the moral grandeur of the event which this reservation commemorates. What with the monuments and historical tablets and lines of stone to mark the position of the soldiers there would be, in his view, altogether too much art of one kind or another in the park, and he insists that what we want is more of nature—and nature without any artificial ornaments; certainly we do not want any gardener to dress up the landscape for visitors.

Beyond question the feeling which inspires this objection is a worthy one. The mistake is that the objector has no adequate appreciation of the true functions of an artist in landscape. Here are fifteen square miles of the Chickamauga battle ground, besides several outlying points which have been purchased, and which are to be made accessible for thousands of people, and all this is to be practically inhabited in the future by attendants and visitors which will increase in number as time rolls on. It is absurd to suppose that the face of the country will not be interfered with in some way by the constructions that are needed and by its continued occupation by man. Of course, the rivers and mountain ridges will always be there, and so, perhaps, will the forest, but the entire surface must be in constant process of change, and the problem is how to control and direct the unsleeping forces of nature and the persistent influence of man so that they will work together to preserve and develop the scenery of the great park in accordance with its real spirit and original meaning.

In the first place, there must be roads and paths for transportation. It is very clear that if an engineer is employed to make these roads his professional duty would lead him to consult, primarily, convenience and economy in construction, and the same might be true of the shelters and other necessary architectural work. Suppose, however, the design were in charge of an artist who not only appreciates scenery for its full value, but who by long practice knows why it is beautiful or sublime, and who is able to analyze it and judge which are its essential elements to be saved at all hazards. It is very plain that the landscape would suffer less mutilation under such conditions, since in all his efforts the leading purpose of the designer would be to preserve and develop that undefinable charm which appeals directly to the imagination. Again, such an artist instinctively apprehends the points of view from which the scenery makes its most impressive appeal. He would plan, therefore, to lead the spectator by pleasant approaches to where some inspiring prospect bursts upon his view, or where through opened vistas his eye can feast on well-composed pictures from which everything that distracts and belittles is shut out by a frame of foliage.

But, more than this, the country, if left absolutely alone, is undergoing perpetual transformation. Not only will trees be growing up—they will be dying. The mold will be washing down from the slopes and the mountains will grow more sterile as the valleys are enriched with booty from the hills. The competent artist in landscape will have a plan to guide all these forces in the direction of preserving the poetry of the scene. For example, if soil and leaf-mold are placed in pockets on the face of these almost perpendicular cliffs and appropriate seeds and plants are set therein just as nature does whenever she has time and opportunity, the characteristic appearance of such a place can be preserved forever, and even enhanced. A similar care in the woods can keep the trees in constant vigor, and along the raw road-borders trees and shrubs and herbs can be introduced that will harmonize at once with their surroundings, so that in a season or so foregrounds could be produced which nature would require a score of years to develop.

Work of this sort, we are aware, is not generally considered landscape-gardening. Our correspondent evidently considers that the field of landscape art is confined to making smooth lawns and bordering them with Golden Elders, Kilmarnock Willows and Purple-leaved Plums, with, perhaps, a beautiful pattern bed of Coleus and Alternanthera in the middle. Now, a true landscape-gardener does not consider a place trivial simply because it is small, and even the surroundings of a modest country house may bring out some of his clearest thoughts. Nor is his work entirely constructive, as it sometimes is, as, for example, in Central Park, where pastoral landscapes were absolutely created by blasting out a place for them from sterile ridges of rock. But it is quite as much the function of the true artist to preserve and develop and display to the best advantage as it is to create, and our great military parks will not be what they should be if they are turned over to an engineer to construct the roads, while every state and regiment is allowed to design its own monuments and select their position. It is very evident that if left to such chances the entire park scheme in every instance will be broken into fragments, not one of which has any proper relation to or coordination with the remainder. Not only will all sense of historical perspective be lost, but there will be no unity of purpose, nothing but groups of conflicting elements which assert in one place what is denied in another.

Beyond any question, each one of these parks should have a plan, an intelligent design to begin with and an ideal toward which it can grow for all time to come. No man of taste would ask to have anything foreign or fanciful imported into such work, but every one would take satisfaction in knowing that all the native beauty of the spot was to be unfolded under the charge of some real

artist who not only has respect for nature, but who is able to coöperate with her in perfect sympathy.

ONE of the speakers at the recent meeting of the Forestry Association at Springfield, Massachusetts, was Baron Beno Reinhhardt von Herman, who is an attaché of the German Embassy at Washington. Baron von Herman has been sent to this Government as an agricultural expert, and inasmuch as he holds in the Civil Service of Wurttemberg the rank of Forest Assessor, it is evident that he is prepared to send to his Government intelligent reports about our forests, and to give our methods of managing them. It is to be hoped that he will learn something of value from our practice, but perhaps he can serve the interests of his country best by explaining the disasters that we are inviting by the utter lack of forethought that has characterized our great lumbering operations. Forestry has been practiced in an intelligent way in Germany now for many years, and able men are making it their life work to investigate subjects relating to forestry as a science and an art. And yet the German Government thinks it worth while to send experts to various countries in order to acquire more knowledge and present more facts for study and comparison. In our own country, where there is no such thing as scientific forestry, and very few persons give serious attention to this subject, the general opinion of the people and of the Government is that we know quite enough, and that our woods can take care of themselves. Congress cannot even be induced to oppose any check to lawless depredations on our wooded domain, and if it were suggested that we should send some one to other countries to acquire some knowledge in this matter the idea would be considered preposterous.

Notes on Western New York Woodlands.—II.

THE tracts of timber which survived longest in large bodies were the swamps of Tamarack and Cedar, or those of flinty land covered with Oak, interspersed with Pine. These lands were the least desirable for the plow. Some of these tracts originally embraced several square miles, but are now much reduced or nearly gone. The straight, slender trunks of the Tamarack were in demand for poles, for ladders, or for pump-logs and underground conduits for water, since they were easy to bore and lasted well. The White Cedar went for fence-posts and railway-ties. When the land was drained the Tamarack died out, and the peat soil, exposed to sun and frost, gradually changed into good meadow-land, or provided a soil well adapted to truck-farming. The White Cedar did not so readily die out, since it frequently grows on higher lands.

The most abundant trees of the upland woods are the Beech and Hard Maple. On light soils, and where there is a considerable mixture of sand or gravel with the clay loam, the Oaks predominate, interspersed with Hickory, and sometimes with the Chestnut. In colder and higher tracts, or along the banks of streams, the Hemlock is frequent, or even abundant. The Basswood is common in the richer uplands, among Beeches and Maples. Here also the White Ash is most often seen. As the Basswood is one of the most desirable of the surviving trees for soft-wood lumber, it has been much thinned out, and good trees are becoming scarce. The larger trees are apt to be hollow at the base, and easily break off under sudden stress of wind. It has become a matter of common observation that it is not now easy to find a sound Basswood two feet or more in diameter, though this was not always the case. The trees, for some reason, seem subject to an earlier decay than formerly.

Where the Beech and Maple abound the White Oak is occasionally mixed with them, but is mostly confined to the low land, where it is much more common than the Swamp White Oak. The Red Oak is much more commonly seen with the Beech and Maple. In flinty and gravelly soils the most common Oaks are the White, Red and Black

Oaks. Here also occurs the Chestnut Oak; it is usually less abundant than the other kinds and may also be found in the wet lands.

The changes that have been produced by clearing, exposure to sun and wind, drainage and pasturage, furnish a good opportunity to study trees in their powers of adaptation. Those which can most readily change, or have a greater range of conditions, or fruit most abundantly and germinate most easily, soon gain the mastery and become the predominating kinds. In the upland woods the Beech and Maple, wherever they grow, prove to be among the most aggressive and have increased in number of individuals relatively to others. In woods not pastured, or but little pastured, they spring up quickly, especially the Sugar Maple, and soon make a dense undergrowth or cover the more open spaces. So do the Oaks, Hickories and Chestnuts in their respective localities.

The tree which seems to have fared worst in this struggle for existence is the Black Ash. It was once very abundant in the swamps, the trees frequently outnumbering all other species combined. Now they are mostly dead or dying, and it is rare to find one leafy to the top. It was once the principal source of rail-timber in many localities. The suppression of the Black Ash has been caused by the drier conditions. Great changes have been made in the swampy lands. Those in which water stood throughout the year, except in very dry seasons, are now dry for the greater part of summer and fall, and can often be traversed dry-shod almost anywhere as early as the month of May. In wet situations the tree once flourished, rooting in the black swamp muck, the crowns of the roots rising much above the surface. When the swamps are dry the upper parts of the roots are exposed and they suffer like those from which the soil has been removed or burned away. When decay has gone far enough the trunks fall over. Though this tree can be adapted to drier conditions when young, seedlings do not successfully compete with those of White Elm, the Red and the Silver Maples, the species commonly associated with it in the swamps. These have now become the prevailing trees in the low grounds, and few young Black Ash trees can now be found in such woods. The Elms and the soft Maples have gained the mastery, and are also crowding the White Oaks.

Another tree which is becoming scarce in many places is the Black or Cherry Birch. It was once abundant in wettish lands. Drier conditions alone have not overcome it. More probably the young growth is destroyed by browsing animals, which relish its foliage. The larger trees have been used for cabinet-work, but there is little prospect of their being replaced if left to the common chances of the woods.

The Black Cherry has a similar use, and holds its own fairly well. Its seeds are widely scattered by birds, so that it springs up by fence-rows or in other favorable situations. Its bitter leaves and bark are not relished by cattle, and it has a fair chance of surviving when once started. *Prunus Avium*, or the Bird Cherry, which has escaped quite extensively from cultivation, has become a common tree by roadsides and the borders of wood-lots. It has invaded the woods to some extent, and holds a place there beside the Wild Cherry. I have seen it in the thick woods with a trunk a foot and more in diameter and fifty or sixty feet tall. It makes a forest-tree similar in habit to the wild Black Cherry, with its trunk as free from limbs when in the crowded woods. It may in time rival the Black Cherry in abundance, should it thoroughly adapt itself to wild conditions, since it is much less liable to attacks of the black-knot than the Black Cherry and Choke Cherry.

Though so much of the forest covering of this good agricultural region has been removed, a partial compensation in the way of shaded ground is found in the increased area of farm-land devoted to orchards. The land is in a measure tree-covered, sometimes as effectually as in the more open woods devoted to pasturage.

One noticeable result of this deforestation is the greater

violence of the winds. They sweep freely through the open spaces, and their strength and persistence seem increased. There is also more abruptness in local weather changes and greater contrasts in temperature. The average climate has not changed, but has been altered in its details. Hence the greater liability to frosts and cold winds, which are sometimes nearly as damaging to the fruit crop as the frost. While in the region during the changeable weather of May of the present year, I examined some orchards after the results were fully apparent. Those trees fared best on the eastern slopes of hills or east of belts of wood. Where the fruit was not entirely destroyed, a difference was perceptible between the east and west sides of the same tree. The cold wind which preceded the frost came from the west, and when it subsided the localities most affected were those which had been exposed the longest to its influence. In the low ground, where the cold air settled, there was less difference in this respect even in sheltered areas.

It is also evident that fields are more subject to dryness in a deforested region. This is not on account of a diminished rainfall, but from the lack of conservation of the water which falls. It runs off quickly from the fields, hurried on by the ditches and open waterways, or is more rapidly dried up by the sun. The effect upon the streams is clearly seen. They rise suddenly, and are full to overflowing in the rainy season or after heavy showers, but are low or dry at other times. Brooks that were once perennial are dry for a great part of the year. The springs which feed them and tend to keep them running are mostly along the bases of the hills. They once provided water in the pastures for the stock. Now they are more uncertain, more often go entirely dry, and resort must be had to wells, which go deeper into the ground.

It is not a region that washes badly, partly from the character of the soil, partly because the hillsides are kept in grass when not covered with other crops, still much of the soil is carried down into the valleys or hurried off in the turbid waters of the swollen streams. On the hills, especially the steeper ones, there is a tendency of the soil to become poorer and thinner. The fact might be hard to demonstrate, but it is highly probable that the region has already been denuded of trees beyond what is needed for the best agricultural results. With more of the hills, or especially their steeper sides, left in forest, the land in the valleys and on the gentler slopes would evidently be better watered, more productive and more certain to yield a remunerative crop.

Chicago, Ill.

E. J. Hill.

Autumnal Changes in Leaves.—I.

THE gorgeous autumnal foliage of our temperate climate appeals to us all in different ways. Poetical and theological views of this phenomenon are interesting and elevating, but they hardly satisfy people with scientific curiosity. The variety of these colors is surprising if we compare them, for instance, with the plates of Ridgway's *Nomenclature*. There are the ochre-yellow of the Poplar and the closely allied, yet distinct, hues of Milkweed, Elm and White Maple; the orange of Sassafras and Black Birch; the crimson of the Huckleberry, Sumach and Woodbine. Many plants, such as Sumach and Red Maple, show beautiful combinations of yellows and reds, especially when these colors are relieved by more or less green. In Red Maple leaves, one who is not color-blind may distinguish orange, scarlet and vermilion, rose-pink, lake-red, rose-red, carmine, crimson and maroon, to say nothing of orange, orange-buff and ochre-yellow. Purple hues are not common, but are found in some Oaks, among the botanically troublesome Asters, and elsewhere. Sober brown leaves show exquisite varieties of color before becoming part of mother earth. Sassafras leaves become russet; raw umber is the hue of Scrub Oak, and Buttonwood leaves assume a rich Vandyke-brown.

Before venturing upon some explanation of the way these colors are formed, it may be well to state that

autumn leaves are best preserved by covering them with a sheet of paper, pressing with a hot iron upon which paraffine has been rubbed, and flattening and drying between papers afterward. Leaves thus prepared will retain flexibility and color for years, but if pressed without paraffine they will soon become dull and brittle.

It will be found instructive to record the dates at which various kinds of leaves change color, for comparison of such dates shows, in a rough way, the relative vitality of different species of plants as well as of individuals of the same species. Early in July, in the vicinity of Boston, the root leaves of many tender herbs and the oldest leaves of Sumach begin to change. Near the end of the month many leaves of Elm and Maple color and fall, but such leaves are noticeably small and often deformed. By the first of September a wholesale coloring has begun among Blueberry, Blackberry, Sumachs and other plants, although Maples, Oaks and Poplars are not generally changed. Before the end of this month Red Maples are intensely colored, while Sugar Maples are not at their brightest until the middle of October, in company with the Poplars. Last of all come Dogwood and Scarlet Oak, alone in their glory among the withered leaves of late October.

Our autumnal colors are admitted to be much more brilliant than those of Europe, where Maples and Oaks are notably fewer in number and variety. Yet the brilliancy is relatively less in the old country if we compare similar trees in corresponding climates or observe American trees when cultivated abroad. This is, doubtfully, attributed to the "greater transparency of our atmosphere and the consequent greater intensity of the light," but no exact observations upon this subject have yet been made.

Certain it is that intensity of light has an important bearing upon the color changes of leaves. Exposed leaves are colored sooner and stronger than shaded ones, other things being equal. Yet the oldest, or first exhausted, leaves of a plant are the first to turn, even when more or less shaded, as also occurs with stunted leaves of low vitality. Again, a green leaf of Red Maple, artificially darkened when about to turn, undergoes no striking color change. If a part only is shaded, as by a strip of tinfoil, that part remains green, while the rest becomes yellow. If part of a yellow leaf is shielded from sunlight it stays yellow, while the rest may turn red. The infinite diversity of color distribution in autumnal leaves is, I believe, largely due to the varying amount of shading from sunlight which any individual leaf undergoes from other leaves, etc. I have found a crimson Sumach leaf crossed by an oblique yellow band where a branch had pressed upon it; also upon a red leaf of Maple a distinct photograph of an overlying leaf. A person's initials cut from paper and pasted upon a green leaf or fruit will be sharply defined in green after surrounding parts have assumed shades of red or yellow.

Now, for an adequate explanation of these effects of light, or better, light and heat, we suggest the following: The leaf is a transitory structure whose length of life is adapted to the character of the climate, and soon grows to its maximum size, which then limits its capacity for the preparation of food. This assimilation, occurring in a green leaf and only during sunlight, necessitates the continual formation and accumulation in the leaf of certain waste products, which must gradually reduce the amount of assimilation itself. The leaf is choked by its own excretions, and, becoming less able to repair its normal waste of tissue, succumbs more readily to oxidation. The heat accompanying sunlight not only furthers assimilation—in fact, is essential to it—but also hastens the death of the leaf by accelerating the combination of oxygen with its tissues and the action of acids which are formed in leaves as by-products. The effect of shading leaves from sunlight, then, is simply to retard not only the normal assimilation, but also the subsequent disintegration, which is indicated by color changes, and is just as normal in its way. In fact, leaves and bark are the excretory systems of plants, for by their means useless chemical compounds are periodically re-

turned to the soil ; and the fall of the leaf is an intentional phenomenon, so to speak.

More or less moisture in summer is noticeably followed by a corresponding greater or less brilliancy of color in autumn. During a moist summer the cuticle of a leaf remains thin and its colors are vivid. In a dry summer, however, this cuticle becomes thicker and harder, in order to prevent an injurious loss of water from the plant ; and while bright colors may form within the leaf, they appear dull because seen through the more opaque skin or epidermis. The bearing of this upon the relative brilliancy of American and European colors is plain.

It is a popular belief that autumn leaves are colored by frost in some vague way. This is easily disproved, for a Maple frequently assumes its blazing colors in hottest summer. Moreover, it is really hard to see any perceptible acceleration of color development after frost has occurred.

The best-accepted explanation attributes the yellows and red to the action of atmospheric oxygen upon the normal green coloring matter of leaves, a process somewhat comparable to the rusting of iron. Many facts favor this view. We know, by direct experiment, that the green parts of plants absorb oxygen at night and exhale the same kind of gas during sunlight. Now, when leaves begin to turn they cease to exhale oxygen, but continue to inhale it, in gradually diminishing amount, as coloration continues. Coloration is, therefore, correlated with retention of oxygen in leaves, and chemical examination of the yellow and red pigments shows they are probably made in many cases by oxidation of the original green one. Chemically speaking, the "Poison Ivy, blushing its sins as scarlet," performs this touching act by disintegrating its chlorophyll into compounds of the erythrophyll and xanthophyll groups.

This green coloring matter of plants, chlorophyll, is of vast physiological importance, for it is absolutely essential to the process of assimilation. Fungi, naturally devoid of chlorophyll, always steal their food, ready made, from other plants which have made their own living. A seed grown in darkness ceases growth when the food stored in the seed itself is exhausted. No new food can be made without sunlight, and the plant is yellow, except in a few cases. This yellow color is frequently seen in grass which has grown under a board, and is due to a pigment called etiolin, which is always antecedent to the formation of the green pigment in sunlight.

The color of a healthy leaf is made by a multitude of green granules, usually roundish, distributed in most of the sacs or cells of the leaf. Each granule is essentially a particle of that formidable protoplasm, "the physical basis of life," and resembles a sponge which is colorless itself, yet is saturated with a green liquid consisting of oils in which the pigment is dissolved. It must not be supposed that chlorophyll itself can assimilate food. A solution of chlorophyll is incapable of absorbing carbon dioxide to form organic matter from that gas and water and eliminate oxygen ; but this power is possessed by each protoplasmic grain in which the green pigment is lodged.

Essential as this pigment is, its physiological action is involved in doubt. A very plausible theory is that chlorophyll absorbs red rays of solar light which would most injuriously heat plant tissues and facilitate the combination of oxygen with them ; yet, considering the extensive researches made upon chlorophyll by keen investigators, it is surprising that we still know so little about it. It has been impossible to obtain the pure pigment owing to the difficulty of removing various oils, fats, etc., always associated with it ; also because it rapidly decomposes into other substances, so that the chemist is not sure whether he is juggling with chlorophyll or with some of its derivatives. We shall, however, state those best-ascertained properties of chlorophyll which are important in this connection, and will then indicate how the fundamental green pigment is probably altered to form conspicuous autumnal colors.

Cambridge, Mass.

Justus Watson Folsom.

New or Little-known Plants.

Agave Utahensis.

OUR illustration on page 385 of this issue will give some idea of the appearance of the vegetation that clothes the bluffs and cliffs which rise from the slopes of the Grand Cañon of the Colorado, in northern Arizona, at the point where the river rushes along the bottom of an abyss six thousand feet deep and some thirteen miles across at the plateau level. In the centre of the illustration is a plant of *Agave Utahensis* ; on the left is *Echinocactus polycephalus*, and in the foreground appears an *Opuntia erinacea*, Cereus-like in appearance with its narrow, thick, long-spined joints, and very abundant in northern Arizona. The slopes of the cañon are dotted with these and other inhabitants of the desert, but the great Colorado plateau, which is divided by the cañon, is covered with a splendid open forest of the Yellow Pine, *Pinus ponderosa*, which in northern Arizona and southern Utah forms one of the largest continuous Pine forests of the world. The Pine occasionally extends over the rim of the cañon, and with it other trees and shrubs grow down the sides for a distance of a thousand or fifteen hundred feet; among them are the White Fir (*Abies concolor*), the Douglas Fir, the Nut Pine, the Utah Juniper, *Cowania Mexicana*, the curious simple-leaved Ash (*Fraxinus anomala*), a flowering Ash (*Fraxinus cuspidata*), the western Shad-bush and *Ostrya Knowltoni*, one of the rarest and most local of all North American trees, and, up to this time, only known at one place on the slopes of this cañon. It is this mingling of northern and southern plants, the inhabitants of northern mountain forests with the Agaves and Cacti of more southern and more arid regions, which makes the Grand Cañon, which is one of the natural marvels of the world and a spot unsurpassed in this country in grandeur and picturesqueness, such an interesting botanical ground.

Agave Utahensis was discovered several years ago by Dr. Edward Palmer near St. George, in southern Utah, and was first described by Dr. Engelmann in Watson's report on the botany of the country along the fortieth parallel of north latitude explored by Clarence King. It is one of the species (*Geminifloræ*) in which the flowers are borne in pairs in the axil of a bract on a tall scape, and form a dense elongated spike. The leaves of *Agave Utahensis* are lanceolate, concave, thick, hard and glaucous, long-pointed, twelve or fourteen inches long and from two to three inches broad, with pale terminal spines and broad white lateral teeth. The slender spike of bright yellow flowers is three feet long, and is often raised on a stem seven or eight feet high. When the plant is in flower and when the flowers are succeeded by the pale yellow pods which do not fall until late in the autumn or the beginning of winter, and long after the time when they open and shed their seeds, the tall wand-like spike waves backward and forward, and, flickering in the sunlight, enlivens with its strange and wonderful beauty the dark forbidding slopes of rock which this plant selects as its favorite home.

Plant Notes.

BILLBERGIA LIBONIANA—During the late summer this is a very showy plant for the conservatory. It is one of the most highly colored of the Billbergias, which, taken together, constitute a most beautiful genus. Twenty or more flowers are borne on a close terminal spike ; they are about two inches long, rich scarlet, tipped with blue ; the petals are more or less recurved, and the sepals half the length of the petals, rosy, fading to white at the base. The anthers are bright yellow, and the stigma blue. The numerous bracts below the flowers are lanceolate, two to three inches long, membranous, a bright rosy color, the largest crowded immediately below the flower-spike. The scape is twelve to eighteen inches high, white, covered with large rosy bracts. Leaves lingulate, two to three

inches wide by ten or more inches long; ten to twelve in a dense rosette, pale green, and a deep violet-purple inside at the base. The flowers of this species are more showy, but not as lasting as those of *B. rhodo-cyanæa*.

RESTIO SUBVERTICILLATA.—This is a showy plant which is rarely seen in greenhouse collections. Its scarcity is probably due to the fact that it is of slow growth and difficult to propagate. In its native country it is known as the Rope Grass Plant. The thin, wiry stems are covered with an immense number of long grass-like spikelets, which give to it a graceful feathery appearance. It grows about eight feet high and is considered by many quite as ornamental as *Papyrus Antiquorum*. Unlike the latter plant, however, it only needs a temperature in winter sufficient to keep out frost. This Restio is sometimes met with under the name of *Willdenovia teres*, an entirely different thing.

VIBURNUM OPULUS.—Among the most interesting shrubs in Prospect Park now are the so-called Cranberry Trees, whose bright berries have now come to their best color. Many

which is nothing but a monstrous form of it, in which the flowers are all sterile. Of course, the Guelder Rose never bears any fruit and is, therefore, to this extent inferior to the fertile plant. The Guelder Rose is also much more subject to the attacks of the aphis, probably because it has become weakened by long propagation from cuttings, instead of being renewed from seed. We ought to add that *V. tomentosum*, another Asiatic plant, bears the same relation to the Japanese Snowball, *V. plicatum*, that our High-bush Cranberry does to the common Snowball. This plant was figured and described in vol. iv., pages 594-5. We have never seen it in fruit in this country, but in habit as well as in flower it is preferable to the sterile *V. plicatum*, and is in every way a shrub of merit.

CLEMATIS VIRGINIANA.—Although one of the most common, this is one of the most graceful and beautiful of our native climbers, and no plant adds more to the beauty of our roadsides or swamp borders. It is usually found rambling over masses of shrubbery, and in August every branch is a long

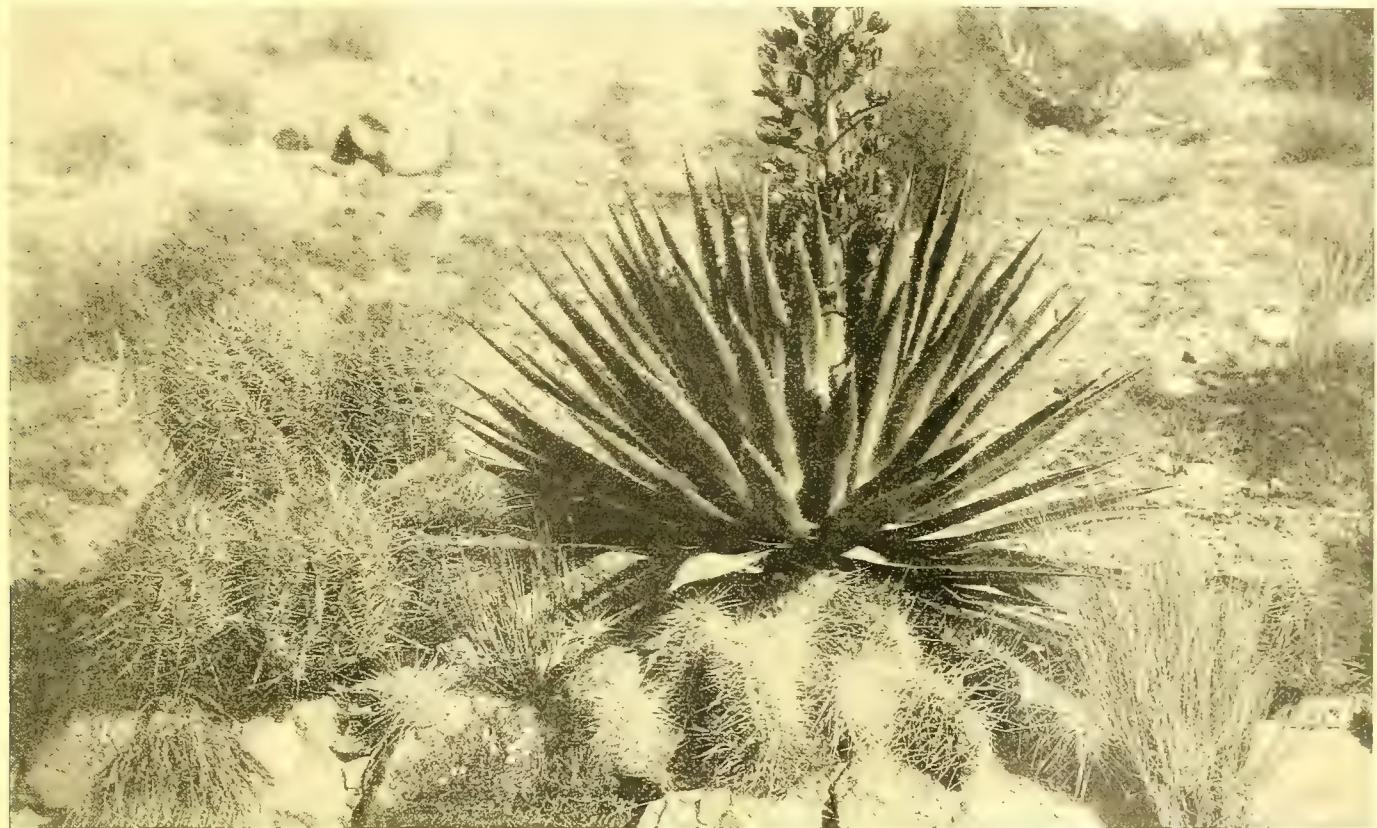


Fig. 53.—*Agave Utahensis* in the Grand Cañon of the Colorado, Arizona.—See page 384.

of the Viburnums, native and foreign, are worth planting for their fruit alone, but none of them are more conspicuously beautiful in this respect than this native plant, after its cymes of round drupes have turned to their clear red color. We call this a native shrub, but it ranges quite round the globe, being found in northern Europe and in northern Asia, as well as in this country, and it may be worth repeating that some of these Viburnums now growing in the Arnold Arboretum, from seed obtained on the mountains about Pekin, have a greater decorative value than either the American or the European forms. The sterile ray flowers of these Chinese plants are much larger, and the anthers, instead of being green, are bright purple. The fruits of *V. Opulus* remain on the branches for weeks, or until the birds are driven to eat them for lack of other food, as they do not seem to relish their acid flavor. Often they cling to the branches until the next spring and retain their bright colors to a considerable extent. Although this Viburnum is not nearly as common in gardens, it is preferable for many reasons to the Snowball or Guelder Rose,

festoon of cream-white flowers, which appear in axillary clusters. These are not quite so delicate as the pure white ones of *Clematis flammula*, but they are very fragrant. These flowers are followed by clusters of fruit with feathery gray tails, and these appendages to the seeds glitter in the autumn sun like masses of flowers. This common Virgin's Bower thrives under cultivation and makes a wonderful growth in deep, rich soil. In large places it can be planted to advantage in the shrubbery, but, in fact, it never is so beautiful as in a wayside thicket. Some plants bear only staminate flowers, and if the fruits are wanted, plants should be propagated only from individuals with perfect flowers.

Cultural Department.

Gardening in North Carolina.

WE tried, last winter, several plans for the protection of Fig-trees, and the uncommonly cold winter gave us an opportunity to test their merits, for all unprotected Fig-trees here were badly cut back. While we did not have at any time

the intense cold experienced here in January, 1893, the cold was longer continued and more trying. Most of our Figs are branched from the ground and can easily be bent down for winter protection. Some of them were thus bent and covered with earth, just as I had treated them, with success, in northern Maryland. Others were bent down and secured by pegs with hooks and were then covered with evergreen boughs. A few that were of such erect habit and so stout that they could not be bent to the ground, were thatched over the trunk and limbs with straw. The buried trees suffered badly; nearly all the young growth rotted off, and many large limbs were decayed in the spring. For all the cold there was too much soft and wet weather for the earth cover to be a success. This has been our experience with buried Fig-trees here for two winters—a warm and a cold one. The first winter we tried it there was no need for any protection, and the trees came out worse than those that were unprotected, but we supposed that the plan would be a success when we found what a hard winter was on us. It seems evident that this method will not do in the south, though I was perfectly successful with it for six consecutive years in northern Maryland. The trees that were merely covered with Pine boughs came out in better condition than the buried ones, and were the ones to give us our first early figs, though even on these most of the early crop, which is already set in fall, was destroyed. But the White Marseilles gave us some remarkably fine fruit. The trees that were thatched with straw were all of the Celestial variety. These came out in fine condition, and have been giving us fruit continuously since the last of July. Whether any other varieties would have done as well with the same treatment remains to be proved, for the Celestial is rather more hardy than some others. A lot of over one hundred plants, four years old, grown from seed of the best layer figs we could find in the stores, were left unprotected and were cut back badly. Nearly all of them have this year set late fruit, which will hardly ripen.

Last spring I turned out from pots some plants of Araucaria Bidwillii, and left one out entirely unprotected on the north front of my house. The winter that followed was a hard trial to a young green plant, without any old woody stem, and it was killed to the ground. We supposed it entirely dead, but to our surprise it has grown from the base, and if it could be assured of a few mild winters I believe it would finally stand well, though it is not as hardy as *A. imbricaria*.

Last summer our Neriums were the glory of the neighborhood and were in profuse bloom all the season. There were ten plants, all four years old. Last winter finished all but one, though we had them thatched with straw. The one that survived lost its top, and now has grown a new one three feet high.

We are delighted with Spiraea Anthony Waterer. Our little plants, set from three-inch pots last spring, have been in profuse bloom all summer, and are still blooming. Their dwarf habit and numerous flowers will make this variety valuable for the borders of shrubbery. With us the flowers are of a more brilliant color than those of *S. bumalda*.

The hard winter prevented Pyrus Japonica from blooming as it usually does in January and February, and the result is that our bushes are now laden with the golden aromatic fruit. Those who have never seen this fruit perfectly ripened have no idea of its delicious and pervasive odor. Has any one ever tried them for preserving? They are totally inedible raw, but so is the big Chinese quince, which makes a delicious preserve. We have so many I propose to try them.

I have been long convinced that our southern gardeners neglect the Hybrid Perpetual Roses too much. I find that most of them bloom more freely here than they do farther north. On my lawn this summer there has not been a day since early May when I could not cut flowers from some Roses of this class. The new variety, Margaret Dickson, is particularly floriferous, and is still giving us flowers; in fact, it has averaged as many flowers as many of the Tea Roses. The ease with which we can propagate these Roses, from long cuttings set in the open ground in the fall, should make this hardy class more popular here. I have never seen mildew on a plant, though lately the leaf-spot has been doing great damage, and we will need to begin spraying another year. I am disappointed with Crimson Rambler. I bought an extra-sized plant, and it has grown with remarkable luxuriance, but not a flower has it made the whole summer. There have been so many accounts of its wonderful profusion of bloom that the failure of a big plant to throw a single flower is a surprise. Perhaps it will redeem itself next year. If it does not I shall bud something better on its robust stem.

Solanum Seaforthianum has made a remarkable growth, but it, too, makes too few of its pretty clusters of blue flowers.

S. grandiflorum has gone to the top of a tall piazza, but has not shown a single flower-cluster. *Antigonon leptopus* survived the frost, but has made a stunted growth, and will have to hurry if it makes much bloom; but as I transplanted the mass of roots in the spring, that may have retarded it to some extent.

We have fruited eighteen varieties of Mr. Munson's Grapes this season. Some of them are really fine, and most of the others will be useful as stocks for better varieties.

North Carolina Agric'l Exp't Station, Raleigh, N.C.

W. F. Massey.

Bulbous Plants.

IT is always with surprise that one discovers, some fine autumn morning, the glowing vases of the Colchicums, curious plants which send forth naked flowers many months after the vigorous growth of foliage has passed. The bare ground seems especially harsh under the flowers, and these bulbs should always be grown among grass which is seldom mown, or among carpeting plants, since these will serve as a foil to the flowers. *C. speciosum* and the single white are both satisfactory autumnal kinds, reliable with ordinary care. The double white-flowered sort is more rare, and is distinct and pretty with its many narrow petals. Except a few species of Crocus and Sternbergia, the hardy bulbs will not show any more flowers until the first thaw of the new year, unless, perhaps, some precocious Snowdrops venture their blossoms before the rigors of winter begin. The lengthening leaves of the Grape Hyacinths indicate that the winter and spring flowering bulbs are waking up under ground, and most of the hardy bulbs will be found to have made some root-growth, or, at least, to give signs of new life at their bases. This is a warning to plant all such bulbs as soon as possible, that they may not suffer any check and become well established before they are bound by frost. There is no doubt that many bulbs do better for being lifted and dried off, especially if they have been grown in a naturally moist ground, though some of the advantage probably comes from the change of soil. The drying off should not be too prolonged, and there will be no benefit if the bulbs are kept out of the ground some time after they would naturally move. Most deciduous bulbous plants seem to have sharply defined habits as to starting-time, and interference with them in this particular is often resented.

Bulbs are interesting in their potentialities and varied habits, and there can scarcely be too many of them in a garden. Thickened root-stocks, except those known as corms, classed in gardens as bulbs, are usually most tenacious of life. Besides showing many of the most gorgeous flowers, they make it possible to utilize garden space to the best advantage, especially in the early year. The most complete garden, and the one producing the greatest abundance of flowers for the space, will contain a careful selection of hardy plants among which are grown bulbous plants, which in due time are covered with annuals. Succession is the keynote of good gardening.

Bulbs should be secured as soon as possible, not only for the garden, but for the house. All bulbs should be potted at once, even if they are required for succession. It is an easy matter to retard them, and they will become better established if potted early. The Dutch bulbs make the best show and are easily handled if planted in shallow pots known as Lily pans. An eight-inch pan will hold four good Hyacinth bulbs or five to six Roman Hyacinths.

For my small greenhouse I find the most satisfactory winter occupants are small decorative plants, Palms and Ferns, Orchids, a few Begonias, and some odd favorites which have a permanent place here. This collection is supplemented by the various Dutch bulbs which are brought in from time to time from the cache outside. A fairly good and continuous supply of desirable flowers is secured by this procedure, though the house becomes rather congested in late winter with potted bulbs which have not yet ripened. The Orchids which I have accumulated in the last few years have flowered satisfactorily and interested me greatly. They have disappointed me entirely in only one respect. Having read many directions giving elaborate details of cultivation and treatment I gained the impression that they were plants for the skilled professional only. There could be no greater mistake as regards many of them, if a few simple requirements are observed. With the inclination to water too freely I am more apt to kill Begonias than any of the Orchids, which generally seem to be endowed with wonderful vitality. Any one who can grow a Geranium need not hesitate to grow the Orchids which require an ordinary greenhouse temperature. The resting period should always be noted, and a lesson in potting taken from an expert. No plants enjoy a full supply of fresh air more than Orchids. I do not grow these plants because they seem to me

the handsomest of flowers, but simply because they are somewhat unique, give good results for the space occupied, and require less attention in many respects than plants of more rapid and softer growth. Besides, an amateur will usually find the most satisfaction in growing the plants which are not adapted to or are unprofitable for commercial culture. There is no special satisfaction in devoting a small house to Roses, Carnations or other flowers that can be had from the neighboring florist.

Elizabeth, N. J.

J. N. Gerard.

Flower-garden Notes.

FROSTS have occurred much earlier than usual this year, and on September 15th *Alternanthera*, *Coleus* and other tender bedding-plants were completely blackened in many places. Generally our first frost does not come until about October 10th. We prefer to lift a few old plants of *Coleus* and grow these during winter in a moderately warm house. The plants, by judicious pinching, are highly decorative, and a few will furnish a large quantity of cuttings. We lift old roots of *Alternanthera*, trim the plants within reasonable bounds, and plant them quite thickly in boxes, which are placed on a shelf in our Rose-house. Of *Stevia*, *Achyranthus*, *Santolina* and other foliage-plants we pot a few old plants of each, and they yield an abundance of spring cuttings. Among the newer bedding plants, *Strobilanthes Dyerianus* has grown strongly, but its weedy habit is not likely to commend it for extensive future use. *Abutilon Souvenir de Bonn* is the handsomest *Abutilon* we have grown. It attained a height of six feet here, and for tropical beds or planting as individual specimens in mixed borders it can be highly recommended. *Phrynum variegatum* has grown well; the leaves show but little coloring, although grown in a well-exposed situation. We tried some fancy-leaved *Caladiums* in the open this year; they were set in the full sunlight and have made surprisingly good growth, much better than those in pots. These plants were thoroughly wet with the hose every evening during the hot season and occasionally watered with liquid-manure. This experiment shows that *Caladiums*, under favorable conditions, may be fairly well grown in the open air, even in New England.

We generally put our *Geranium* cuttings for bedding into boxes the first week in October. The boxes are filled half their depth with broken pot sherds or shells. Over this we place a layer of sphagnum and fill the balance with sand, which is pressed firmly and watered before the cuttings are inserted. A good soaking is given after the cuttings are in, and the boxes are placed on a shelf close up to the light in a Carnation-house. They require no shading, and the only attention necessary until potting-off time in spring is an occasional watering to keep the cuttings from shriveling, and the removal of any decaying stems or flowers. Fully ninety per cent. of the cuttings should be carried over safely. The popular variety, *Madame Salleroi*, is so easily propagated that a few old plants only need be potted up to secure a large stock of spring cuttings.

Tuberous Begonias, after being killed by frost, should be lifted and laid on a dry shelf in a greenhouse or warm shed. When sufficiently dry we store them in boxes of dry sand and keep them over winter in an ordinary potato cellar. Flowering Cannas should be looked over and carefully labeled before frost comes. If this is not done the varieties are liable to get badly mixed. We always pot a few of each of the best kinds, as they are admirable winter bloomers and brighten the conservatory and greenhouse when showy flowers are none too plentiful.

Tender bedding plants should be cleared away soon after they are cut down by frost. After the plants are removed we have our beds manured and dug over; some gardeners allow this work to wait until spring, but there is enough to be done then which cannot be done in the fall. Dutch bulbs are now arriving, and as these lose vitality while in paper bags, they should be planted out as early as circumstances will permit.

Lawns and drives will be untidy for some weeks to come on account of falling leaves. They should be raked over at least once a week. Newly seeded lawns should be rolled after heavy rains, when the soil is not pasty. Grass verges should be clipped for the last time. Beds, if neatly dug and bordered, help the appearance of a place greatly; too often they have an appearance of utter neglect from October until the next bedding season comes around.

Perennial borders now have a rather disheveled appearance. Frost, heavy rains and high winds spoil their beauty, but varieties of *Helianthus*, *Asters*, hardy *Chrysanthemums*, *Anemone Japonica*, *Colchicums* and other plants are still flow-

ering luxuriantly. The best time to transplant perennials is during October; it is well to take note of the heights of the various plants and mark those it is intended to remove. Hardy plants removed to fresh quarters at this season will, of course, give much better satisfaction than those planted in spring. The ground should be kept well stirred among Sweet Williams and other biennials in nursery beds. Some varieties of these, such as *Antirrhinums*, *Wallflowers* and *Daisies*, we plant into frames about the end of October. Pansies we usually prick out early in October, setting them about four inches apart each way.

Summer-blooming Carnations will continue to flower for some time unless there is severe frost. They should be kept tied up securely to prevent heavy rains from soiling the flowers. We grow late *Asters* in cold frames, and are thus able to protect them in case of early frost. Those grown in the open, if lifted with balls of earth and planted in frames, will furnish good flowers until *Chrysanthemums* bloom. *Cosmos* is a useful flower in October. The plants should be tied to stout stakes, as they break with very little wind. We placed the sashes on *Violet* frames about September 15th; they should be kept on at night and removed during the day when the weather is warm. We run a lath shading over the plants for a short time during the hottest part of the day, until the first of October. Runners, weeds and decaying foliage should be removed each week, and the surface soil stirred frequently. A sharp lookout must be kept for signs of spot; badly infected plants should be pulled up and destroyed, and a spraying of *Bordeaux* mixture given to all others. At no season of the year does the disease spread more swiftly than now, and it is necessary to be on the alert to counteract it.

Taunton, Mass.

W. N. Craig.

Two Good Grapes.

TWO grapes that can be very highly recommended to lovers of spicy rich fruit are the *Hayes* and *Eldorado*. Both of them are very early, ripening this year by September 5th. *Hayes* may be classed as about three days earlier than *Eldorado*. It is a large white grape, about the size of *Diamond*, and much the same translucent color. It is not a rank grower, but is a fairly good wine-maker. The flavor is sweet, but sparkling, and nearly as rich as that of *Lady*. The seeds are few and very small. This is an item of very great importance, as many of our best grapes fail at this point. Nearly all of Rogers' Hybrids, for example, have large seeds and many of them. *Hayes* is a good keeper, on or off the vines, and has no tendency to drop from the cluster. Rot rarely attacks it.

Eldorado is in most ways a close likeness of *Hayes*, and has a reputation of being a shy bearer. My own experience with it indicates that it is not quite a perfect self-pollinator, but when grown with other grapes it is a fine cropper. The color is less showy than that of *Hayes* when fully ripe. Possibly the flavor is a trifle more spicy, like that of the *Lady*. But these two grapes should find a place in every collection where quality is appreciated.

Clinton, N. Y.

E. P. Powell.

Solanum Wendlandi.

ONE of the most promising novelties of recent introduction is this climber, which, although not a new plant, strictly speaking, has only recently been made available to cultivators on this side of the Atlantic. There is an excellent figure of it in *The Garden*, February 1st, 1890, the color of the flowers being, perhaps, a little darker than is the case with plants grown here under a stronger sun. No climbing plant of my acquaintance will cover so much space in a short time as this one. Our plant was a small one, set out in a bench in a greenhouse, and in six weeks covered as many feet each way with a strong growth of rich, dark foliage and many large heads of flowers, some of these over a foot in diameter. The individual flowers open in succession until all have expanded, so that each head of bloom is a thing of beauty for at least a month. The flowers are nearly two inches in diameter and of a pale lavender-blue. I saw it recently growing in the succulent house at Kew, where it was luxuriating in full sunshine and plenty of air, and it seems to me that there is a use for it as a summer climbing plant for outdoor planting in this climate; of course, in warmer sections it should prove hardy, and it would then be a deciduous plant. Wherever this *Solanum* is used it must have a good rich soil to grow in, as it is a great feeder and cannot be treated too liberally. In the issue of *The Garden* referred to we are told that "Kew is indebted for this *Solanum* to Mr. Wendland, Director of the famous Botanic Gardens at Herrenhausen, who sent a plant of it in 1882, with the

information that it came from the colder regions of Costa Rica." As Director Wendland went to Central America in 1858-59 on a botanical mission, it is to be presumed that he brought home this among the many plants collected, and the wonder is that it has remained so long hidden from cultivators; there seems to be no difficulty in propagating it from cuttings made of the least succulent shoots, and we may soon see it largely used as a decorative plant.

It should be noted that the flowers close up at nightfall. This defect or peculiarity hinders their use in a cut state somewhat, but it will not be considered much of a detraction from the value of the plant if used as a climber, either indoors or out in the warm months.

South Lancaster, Mass.

E. O. Orpet.

[In many of the gardens of San Diego and Santa Barbara, California, *Solanum Wendlandi* is now well established, growing to the height of thirty or forty feet, and displaying during a large part of the year its clusters of beautiful flowers.—ED.]

Keeping Pears.—If pears are wanted for late fall and winter eating pick them early and handle as carefully as possible. Get a package of paper, such as is used to wrap oranges, and wrap each pear separately. Then pack the fruit in shallow boxes and store in a cool, dark, dry place. The nearer the temperature can be kept to the freezing-point the longer the pears will keep. By wrapping in paper the flavor is not lost as it is when pears are kept in cold storage. Early picking and perfectly sound specimens are essential.

Plant a few Winter Pears.—Nearly every one likes pears, yet few have the fruit after Thanksgiving or Christmas. Much attention has been paid to late-keeping pears during recent years, and there is now quite an extensive list of fine table varieties that keep well into the winter and spring months. Winter Nelis is best known, but Lawrence, Josephine de Malines and Duhamel du Monceau are deserving of a place in every garden. Colonel Wilder and P. Barry are pears of more recent introduction, and while neither of them is a good grower, the fact that they keep until March and April makes them valuable to the amateur.

New York.

Edwin C. Powell.

Correspondence.

What Shall We Do with the Birds?

To the Editor of GARDEN AND FOREST:

Sir,—Most of us have been taught to reverence the birds, and we are inclined to resent at once any evil report with regard to their behavior. The ornithologist demonstrates their usefulness by presenting long lists of the insects found in their stomachs, and, even if we are not convinced of the actual good they do, we enjoy their beauty and their songs, and are glad of an opportunity to befriend them; yet, in spite of this sentiment, I do not recall an enemy which I consider more serious in this region than the birds, or a greater obstacle to profitable fruit-growing. Last year (*GARDEN AND FOREST*, vol. vii., page 414) I called attention to the injury done to apples by birds. It was there suggested that, as the season had been exceedingly dry, the ordinary supplies of bird-food might be deficient, or that the birds might attack the apples to get the moisture contained in them. We find, however, that their conduct this year is no better; in fact, it seems to be worse, for the reason that they have had better opportunities to exercise their evil propensities.

Of course, the birds are expected to take a liberal supply of cherries, juneberries and the like, but Nebraska birds are not to be put off with any ordinary division of proceeds. In the Experiment Station orchard they render the crop of summer and fall apples practically valueless, for scarcely an apple reaches maturity uninjured. To be sure, there is a part of nearly every apple that can be utilized for home use, provided it is wanted very soon after the bird takes his share of it, but this necessitates picking the fruit almost daily.

The trouble does not stop with the orchard, however. This year there are a few grapes, and the birds claim even a greater share of these than of the apples. I have not been able to find a perfect cluster that is even well colored, not to say ripe. In all cases the grapes are attacked as soon as they begin to color, and in many cases not a perfect berry can be found. To be sure, the crop is a poor one, the frost having destroyed the greater portion in early spring, but I am told that the result is not greatly different in many cases even when the crop is large. Of course, the clusters can be protected by bagging,

but with grapes selling at retail now for twenty and twenty-five cents for a nine-pound basket, there is little encouragement in undertaking grape-culture for profit with the expectation of having to bag every cluster that is harvested.

Within the past few years cultivation of the varieties of the Garden plum, *Prunus domestica*, has become more general in this state, but here again the birds promise to contest the industry. Plum-growing in the past has been confined almost entirely to the native sorts. These have for the most part exceedingly tough skins, and a bird of ordinary perseverance does not attempt to puncture them. The thinner skin of the garden varieties is one of their desirable features, but this makes them vulnerable to the attacks of the birds, and may prevent their extensive introduction.

I am extremely loth to declare war on the birds, but I do not know how to overcome the destruction which they work. The greater part of every agricultural and horticultural crop is required to meet the actual cost of producing the crop, and unless the crop brings some profit it had better not be grown. Suppose, then, that the birds only destroy one-fourth of the crop, which is much less than they are doing on our grounds this year, they have probably taken all the profit out of the business. There is no denying the fact that the birds render great service in the destruction of noxious insects. Leaving all sentiment out of the question, it is impossible to say whether we are able to successfully cope with these insect foes without the birds, even though we have made great strides in the application of insecticides. If a single species of bird were responsible for the injury the problem would be easier, but such is not the case. So many kinds have been observed eating the apples that we are led to believe that the habit is almost universal. It would be an interesting fact if some ornithologist could explain why the same species, which inhabit also the eastern states, are so much more destructive here than there. No one counts on the birds as an enemy to apple-growing in New York or New England, and why should they be here? The answer to this question might explain how to overcome the difficulty.

Agricultural College, Lincoln, Neb.

Fred W. Card.

Notes from Santa Barbara.

To the Editor of GARDEN AND FOREST:

Sir,—In reference to a note by Professor Meehan on trees with triangular stems, recently quoted in *GARDEN AND FOREST*, it is worth mentioning that the most remarkable tree, *Lyonothamnus asplenifolius*, peculiar to the islands of Santa Cruz and Santa Rosa, has, as a rule, triangular stems up to a certain height. Here some other cause than the one suggested by Mr. Meehan for the Philadelphia tree must be looked for. *Lyonothamnus* is generally found growing on the shady side of the hills, and in clumps from very few to perhaps fifty trees together, apparently having sprung up from the very large roots which affect also a triangular shape. Seedlings or small plants are not to be found, owing to the large number of sheep grazing over the islands, but seedlings raised here have proved that they can endure safely the open sun. The hairs that cover the young growth under such conditions assume a pretty red color, contrasting well with the bright green of the glossy Fern-cut leaves.

Every year the number of individuals and of species of Palms which flower here is increasing. This year for the first time here, very likely for the first time in the United States, we have had in bloom *Chamædorea desmoncooides*, from Mexico, one of the scandent species, and *Erythraea armata*, the Blue Palm from Lower California, with floriferous spadices over twelve feet long. This, the most striking of Fan Palms, while much prized now in California and in the gardens of the Mediterranean Riviera, is hardly known, I believe, in the eastern states.

The Melon Papaw, *Carica Papaya*, to which some attention has been drawn lately in agricultural papers, has never been and never will be a success in California, its soft, fleshy roots being too liable to decay during our rainy season, although the rainfall is so meagre. Other kinds of Papaw may, perhaps, be profitably grown, if not for their fruits, for the extraction of papaine, which is much employed in modern therapeutics. *C. quercifolia*, from Argentina and Paraguay, appears to be particularly rich in this alkaloid, and has proved perfectly hardy here, together with *C. gracilis*, with pink-veined, finely cut leaves, and *C. candamarcensis*, both from high altitudes in the Andes. Plants of all three have been blooming, the last mentioned since October, all through the winter, producing thousands of sweet-scented yellowish flowers, all stamineate, and it was not until a few days ago that pistillate flowers

appeared. Fruits are now setting. The other kinds will behave in the same way, very likely.

Santa Barbara, Calif.

F. Franceschi.

Notes from the South-west.

To the Editor of GARDEN AND FOREST:

Sir.—While the north and east have been suffering from drought, the summer of 1895 has been memorable as a wet season in the south-west. We always expect a more or less extended drought during the warm months, though usually this does not set in early enough to prevent fair crops and fine fruit. This year, however, there have been constant rains here for the last six months.

This wet weather has affected variously the farm, orchard and flower garden. It is estimated that at least fifty per cent. of the wheat in this section spoiled in the stacks. Much hay was ruined also, but the crop as a whole was so great that the loss was not felt. Of corn, our staple crop, the yield will be tremendous.

Showers by night and sunshine by day have given us the finest fruit I ever saw. The hills of this particular range of the Ozarks are full of Huckleberry-bushes. The leading fruit-buyer of our little town considers it an extra-good year when he buys 400 gallons of this luscious native fruit. This year he bought nearly 1,100 gallons, and refused 200 more for lack of a market. The astonishing increase was brought about (1) by the mammoth size the fruit attained, the largest berries reaching almost the size of small cherries; and (2) the long period of ripening, which was over a period of nearly seven weeks, instead of the usual month. Blackberries were brought in from the valleys by the tubful. Apples and plums rotted from lack of buyers. Peaches, which our growers think prefer dry weather, have been below the average in size and quality. All other fruit has been surpassingly fine. Our pears have often weighed sixteen and eighteen ounces; from one tree I gathered more than a peck that would average three-fourths of a pound apiece. The Ozarks may well boast of being one of the best fruit regions in the world. The fruit crop of this year is a revelation of what irrigation would do for us in ordinary years. Our land is so rough and mountainous that irrigation would of necessity be expensive, but with such an object-lesson before us there is little doubt that it would pay.

In the flower garden many of the annuals and bedding-plants were drowned out while yet small and feeble. Naturally, such exceptional weather has brought about some exceptional results. Crinums we always grow in the open ground in summer. Usually they bloom three or four times in the season with us. This year the leaves have grown to prodigious length, but not a flower-stalk has appeared. Hybrid perpetual Rose-bushes have grown to a height of eight and nine feet, but the flowers have been less plentiful than usual. In general the tendency has been toward an abnormal growth in length of shoots. Some shrubs have grown as much in height this season as in the previous four seasons put together. Yesterday we measured a summer's shoot of Snowball that was eight feet long. Paulownia imperialis, a strong specimen of which we grow as an annual shrub, cutting it to the ground each spring, so that new and fast-growing shoots are thrown up, has reached a height this year of over seventeen feet.

Take it, all in all, it has been a season whose like we may never see again. We have some curiosity as to whether these quick, soft growths will harden into ripened wood that will endure the winter.

McDonald County, Mo.

Lora S. La Mance.

Rhus Poisoning.

To the Editor of GARDEN AND FOREST:

Sir.—I have read with interest your articles on the Poison Ivy, but none of the remedies which have been suggested by your correspondents have been set forth with any confidence. My inference is that science has as yet discovered no certain preventive or cure for this affliction. I venture, however, to say that the common Houseleek has proved very helpful to me. Some time ago I was severely poisoned, and a friend with whom I was staying in the country advised me to get some Hen-and-Chickens, which I afterward learned was the common name for *Sempervivum Tectorum*, a plant often found in old country gardens. The directions were to take the fleshy leaves, put them in a bag made of old thin muslin, and after bruising them to a pulp lay the bag on the affected parts. I did not follow this direction closely, but merely crushed the leaves and spread them with the juice over the irritated places, with the result that the pain diminished, the poison ceased to

spread and the pustules soon dried up. It may be that some persons are more susceptible to this remedy than others are, just as some persons are more susceptible to the poison, but it is worth trying.

Greenville, N. Y.

R. A.

Myrosma cannæfolia (*Calathea myrosma*).

To the Editor of GARDEN AND FOREST:

Sir.—In the fall of 1893, Dammann & Co., of Naples, offered this plant with a glowing description of its merits as "a decorative plant of high order, with Canna-like leaves and profuse white flowers, and as being a valuable plant to cross with the popular dwarf Cannas." The plant has since then been offered here by dealers as the White Canna, with the same description. Purchasers of the plants have since that time been interested in the supposed treasure, which, however, refused to flower under any treatment. Old plants have at last flowered, and it is no great surprise to find them *Hedychium coronarium*, as the plants have always given indications of being a Gingerwort and not a Calathea. It is to be hoped that American florists will no longer continue to disseminate this plant under an entirely false name and description.

Elizabeth, N. J.

J. N. Gerard.

Recent Publications.

Irrigation Farming. By Lute Wilcox. New York : Orange Judd Co.

The practice of irrigation is as old as agriculture. Indeed, it is an essential part of agriculture in many of the most fruitful regions of the world, and it is certainly a factor of growing importance in the cultivation of the soil over a large portion of the western half of the United States. Even in our eastern states the droughts which come in one or another part of the summer almost annually, make it worth while to consider the question whether it will not pay to take precautions against these arid periods by some arrangements for supplementing the summer rainfall. Where special crops, such as Asparagus, Celery and Strawberries, are grown, it has already been proved that irrigation, to a certain extent, will pay in the east, and wherever land is situated with a convenient supply of water that can be distributed over its surface the possible advantages of the practice are certainly worth considering. This book was written in Colorado, and, of course, the great bulk of it is a description of methods and appliances adapted for use on the great plains. But the various constructions that are here figured and described, with the methods of applying water to vineyards, orchards, gardens and field crops, will be interesting to any reader, and no tiller of the soil can read these chapters without having his views broadened and gaining ideas which he can put to practical use on his own land, wherever it may be.

Notes.

New lemons, from Malaga, are already here; the first lot of 1,000 boxes sold at wholesale auction on Friday brought \$5.62½ to \$6.37½ a box. Some 50,000 boxes of this fruit are expected here in the first week of October.

Ipomœas, which were sent out last spring under the name of the Imperial Japanese Morning Glories, have proved to be about all that was claimed for them in robustness of habit, in the luxuriance of their leaves, many of which are mottled or checkered, and the rich marking and shading of their flowers. We apprehend they will not differ from other Ipomœas in the energetic way in which they reproduce themselves from seed, and that land once seeded with them will continue to produce them forever.

Mr. J. H. Hale is satisfied that the Japan plum in Georgia will form a more profitable market fruit even than peaches. The trees are strong growers and come into bearing a year after planting; in two years they yield half a bushel each, and more, of course, as they grow older. The fruit as grown in Georgia is very large and brilliantly colored, and has a tough skin that makes it easy to ship. Such varieties as the Burbank, for example, if picked while green, but fully grown, and wrapped in paper, can be carried for two or three weeks and will yet ripen into a rich, sweet fruit with fine color. The season of shipping ranges through June and early July. The

Willard ripens about May 20th, the Abundance from June 10th to June 15th, and the Burbank some ten days later.

New Zealand seems to have a progressive Department of Agriculture, if one can judge from the quality of the bulletins and leaflets which it sends forth from time to time. A circular of suggestions for Arbor Day, containing hints for the way in which the day should be celebrated, and particularly how the trees should be planted and cared for afterward, has been issued in ample time for their spring planting, which is, of course, our autumn. A list of trees which are suitable for various purposes in that country is published, and if the celebration is any way general and conducted on the lines laid down, it cannot be other than helpful in spreading the knowledge of and love for trees.

Mr. Andrew S. Fuller writes to *American Gardening* that young and thrifty roots of Hickories, although smooth and apparently without buds, have great power to generate adventitious ones, so that they can be used as cuttings for propagating these trees. Mr. Fuller has been growing some Pecans from root-cuttings, and he notices a great variety in the forms of the leaves, some of which, instead of being compound with eleven to fifteen leaflets, have single leaves eight inches long and half as broad; others have two small leaflets at the base of these which are scarcely larger than good-sized bracts. Of course, this may be nothing but a temporary variation, but it is an interesting departure from the normal type, especially since it occurs only among plants which are grown from root-cuttings.

Mr. Carman's Grape-vines were more heavily laden this year than they have ever been, one reason for which he ascribes to the fact that the rosebugs, although as numerous as in other seasons, found all the food they needed on Spiræas, Viburnums, Magnolias, etc., until the grapes were well set. The insect cares only for the pollen and the flowers and never attacks grapes of any size. He advises, therefore, intermingling the vines with plants which flower at the same time the Grape does and bear flowers which the chafers prefer to those of the Grape. The insect has very decided preferences, and it will devour the food it most relishes before it will attack anything less palatable. For example, on Mr. Carman's grounds it will destroy every flower of the Berckman's Grape, and even eat the thin smooth leaves before it will take up with vines of the pure Labrusca type.

As an example of plant-breeding on scientific principles, Mr. A. W. Slaymaker writes to the *Rural New Yorker* of the Oriole Strawberry. The blossoms of Bubach, a pistillate variety of vigor and productiveness, were fertilized with pollen from the Hoffman, an early southern variety, with vigorous habit and fine fruit which lacks size. The seeds from this cross were planted and two new varieties have been selected, one named Oriole and the other Ideal. Oriole has all the most desirable characteristics of the Bubach and an extra early ripening season, and in this way it combines the good qualities of both berries. It should be said that all the blossoms of the Bubach parent plant, except those which were fertilized with the southern sort, were taken off and the runners removed the year before, so as to give the fruit originating from the cross all possible vigor.

A fortnight ago, in one of our leading fruit-stores, we saw for the first time on sale in this city the apple known as the Red Beitungheimer. They are apples of the first size, cream-colored, with a crimson cheek, white firm flesh, a subacid sprightly flavor, altogether a superior dessert fruit in quality and appearance. Mr. J. B. Wagner, of Blue Stores, New York, who shipped the fruit, writes that it came from one tree planted twelve years ago, although he has set out many more in a new orchard. He describes the tree as a strong grower, with sturdy branches, dark green foliage and a prolific bearer of fair, even-sized and large fruit. Ellwanger & Barry, who have fruited this apple in their experimental orchard for many years, write that they have been so impressed with the size and beauty of the fruit that they have given the tree prominence in their catalogue. Dr. Hoskins writes that while it is said to be of German origin, this variety is not inferior to the Russian varieties in hardiness against cold. The season is about the same as that of the Duchess of Oldenburg, to which apple it is superior in dessert quality. Dr. Hoskins notes that in Vermont the codling moth is very partial to the tree, but this evil can be overcome by spraying. Whether owing to its scarcity, or to its beauty and real value, the apples in market here sold for twice as much as other varieties of the season.

It is estimated that more than two thousand tons of Paris green are annually used as an insecticide in the United States since it is the most rapid and effective of the arsenical prepa-

rations used for this purpose. The chief difficulty in using it is the readiness with which it settles to the bottom of the tank of spraying apparatuses. This is because it is less finely divided than London purple, a point in which the latter compound has a certain advantage. In the last number of *Insect Life* Dr. C. L. Marlatt explains that there is no reason for this coarseness of grain in Paris green, except that the market has demanded a dark-colored article, and the darker color is due to the larger size of the crystals. Paris green would be much more satisfactory as an insecticide if it were reduced to a fine powder, but it would then lose its intensity of color and become whitish, which, in popular estimation, would indicate adulteration. The fact is, that the manufacturer, who for years controlled the market, did so because he had discovered a method of crystallizing the product in unusually large particles, which were, therefore, very deeply colored. Of course, it was less valuable in this form, and yet the dark green large-sized crystals were more difficult to manufacture and more expensive, and the country went on using this for years, although a more effective poison could have been made for less money. In testing Paris green when reduced to fine powder, Dr. Marlatt found that it remained in suspension three times as long as the ordinary product did, while, undoubtedly, the fineness in division made it more effective against insects. The last step in the process of manufacturing Paris green is the combination with acetic acid. When, however, this acid is omitted, an impalpable powder, instead of a crystalline product, is secured, and this will remain in suspension almost perfectly for many hours. Experiments are now in progress to ascertain whether this can be used as a substitute for Paris green, to which it is so superior in fineness, while it costs only half as much.

New Jersey peaches of medium grades continue quite plentiful, \$1.50 a basket at retail being an average price, while choice Smocks and Salways from western Maryland and Pennsylvania mountain orchards bring much higher prices. Brazen Rareripes and Keypoint Whites are now coming from the extreme northern counties of New Jersey, and White Heaths are due. Yellow peaches have, however, preference over white fruit for preserving for home use. A small lot of Rawles Janet apples came from southern California last week, and they were considered by the trade as handsome as any apples ever seen in this city. The largest weighed twenty-four and a half ounces. The color is yellow, shaded with red and striped with crimson. The flesh, which is yellow, juicy and tender, has a vinous flavor, and by some is thought to resemble the Greening apple in taste. This fruit, while very popular in the south and south-west, has not yet been produced in California in great abundance, although many orchards are planted with it. More than 20,000 barrels of apples came into this city last week for local use, a few car-loads of them from western New York and Ohio, the bulk from near-by sections. Firm and well-colored Ben Davis, King, Gravenstein, Alexander and Twenty-ounce Pippins are selling to retail buyers for \$2.75 to \$3.50 a barrel, and a selected car-load of fancy Jonathans have commanded higher prices. The ordinary grades of apples now coming here can be bought as low as fifty and sixty cents to \$1.25 and \$1.50 a barrel in the wholesale markets. The plentiful supply of apples this year, at home and abroad, has made low prices, and recent sales of American apples in Liverpool have netted hardly more than half the returns of last year at this time. Greenings recently brought \$1.50 to \$2.37, and Kings \$3.00 to \$4.62 a barrel at wholesale in English markets, while \$1.74 was an average price at a recent sale in Liverpool. Up to September 14th only 10,297 barrels of apples were sent to England from this country and Canada, 27,399 barrels less than last year, when our home crops were unusually small, but prices abroad were high. The crop in this country is estimated at 7,000,000 to 10,000,000 barrels. Sixty-two car-loads of California fruits were sold here in five days of last week. Among choice pears now coming from that state are Block's Acme. These surpass Beurre Claireau in size, and in color, which is olive and russet, covered with a blush on one side. Selected specimens of the largest size command the highest prices now paid for pears. The increasing use of Alligator pears is evident in the fruit-stores. In a large collection the variety of color which individual fruits show is worthy of study, ranging from solid green to bronze-purple, while some are almost black and others a rich red. In one of the fancy-fruit stores elaborate instructions for making salad of this fruit are furnished to buyers. The price, twenty-five cents each, indicates the demand for this fruit. A small shipment of mangoes arrived a few days ago, and some prickly pears or Indian figs, as they are known in the trade. The decorative rose-pink specimens of this latter fruit are used in making up steamer baskets.

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLES:—Suggestions for Autumn Gardens.....	391
Pinus ponderosa. (With figure.).....	392
Autumnal Changes in Leaves.—II.....	Justus Watson Folsom. 392
FOREIGN CORRESPONDENCE:—London Letter	W. Goldring. 394
PLANT NOTES.....	394
CULTURAL DEPARTMENT:—Late-blooming Hardy Herbaceous Plants.—I.	J. Woodward Manning. 396
Autumn Garden Flowers	T. D. Hatfield. 397
Cannas.....	J. I. Döntan. 398
Hypericum Miserianum.....	E. O. Orpet. 398
CORRESPONDENCE:—Poisoning from Rhus	E. G. Lodeman. 398
RECENT PUBLICATIONS	399
NOTES	400
ILLUSTRATION:—A group of young Pinus ponderosa in the Yosemite Valley. Fig. 54	405

Suggestions for Autumn Gardens.

EVERY true lover of a garden appreciates the feeling of Alfred Austen when he wrote that "autumn possesses the secret of careless grace beyond the spring, and no other season can match its orderly negligence and well-thought-out untidiness in form and color. Even to the garden proper the autumn adds such wonderful touches of happy accident that when it really comes a wise man leaves his garden alone and allows it to fade and wane and slowly and pathetically pass away without any effort to hinder or conceal the decay." But, after all, by making preparations beforehand we can assist the season in its perfect work. There is so much bright color everywhere in the foliage of every wood border and the herbage of every field that any attempt to compete with this flaming display is disheartening. But we can, at least, arrange our gardens so that they will keep in full harmony with the natural progress of the year, and while they may have the element of pathos which comes with the lengthening nights, they need not excite commiseration. The chilling arrest of active vegetable-life is as truly a part of the progressive order of nature as is the bursting forth of new life when the frost loosens its hold, and the preparation for the winter's sleep is often as beautiful as the spring awakening. And then there are many sturdy plants which show no symptoms of failing power, but keep on opening flowers and ripening fruit as if this was their happiest season. The list of hardy perennials which Mr. Manning gives in this week's issue shows that for mere floral display they can furnish all the material we need without the use of a hundred other plants which will make quite as brilliant a show with a little protection.

This calls to mind the fact that one of the principal charms of the garden is its constant change. The flowers of this season are beautiful in themselves, but they have the added charm of a distinct contrast with the flowers that have gone before. Perhaps no class of flowers makes such a strong appeal to the imagination as those of early spring, but a part of the delight we have in them comes from the fact that they are evanescent. The bright colors

of a bed of Tulips, if they kept flowering all summer long, would soon tire us with the monotonous repetition of the same note, while everything about them kept changing. Visitors go many miles now to see a mass of well-selected Rhododendrons in bloom, but if the flowers remained the year through, as the foliage does, nothing would be more wearisome. We admire the exquisitely delicate tints of young unfolding leaves in spring because they soon change to a more sober green. We admire the splendors of our October woodlands because the foliage flames out for a brief season and does not burn before our eyes from May until November. The beauty of each season is evanescent, but it passes through new transformations every day and furnishes surprises all the year through.

This is one reason why set pattern beds made out of plants with vivid and variegated foliage become at last worse than wearisome to the eye. When once the figure is set on the grass its form and color is as unvarying as if it were a spread of painted oilcloth. While everything around them is taking on new forms and fresh colors, these beds remain without any growth, or sequence, or climax of effect. Surely, if plants have any beauty, it is the beauty of life that develops into some new attractiveness from youth to maturity and beyond. A set pattern from which the same colors stare all day long and all the summer through, is practically a lifeless thing in the midst of vicissitude and progress, and when the frost touches it ever so lightly, or blurs a single one of its lines, even the fictitious beauty it seemed once to have is gone and it remains through all the bright autumn days that follow a repulsive wreck.

BUT we can render our gardens a more positive service at this season than by keeping them free from such eyesores as decaying masses of tender plants. Of flowers there need be no lack, but why not arrange to bring some of the most striking of the natural effects of an American autumn within our enclosures? There is a choice among autumn fruits, and even among autumn leaves, and we venture to advise once more, as we have often urged upon planters, the selection of trees and shrubs with a view to the color of their foliage at this season and to the beauty of their fruit. The list of shrubs with fruit of attractive color is so extensive, and these fruits remain in their full beauty so long, that it would not be a difficult matter to make an autumn garden of shrubs alone which would be as interesting for its foliage and fruit as a spring garden could be for its foliage and flowers. The Barberries, the Prinos section of the Hollies, many kinds of Spindle-trees and the allied Bittersweets, Matrimony-vines, Viburnums and Cornuses, Climbing Honeysuckles, Coralberries and Snow-berries, Privets, Hawthorns and Wild Roses, and many more are now decorated with fruits in such a variety of form and color and persistence as to warrant their more extended use.

It is true that in selecting trees for planting, the autumn color of their foliage is often considered an advantage, but who has ever seen in any of our parks a group of different species of trees planted for the primary purpose of exhibiting the harmonies and contrasts of their autumn colors? We are learning something about the physiological changes which cause the breaking up of the pigments of the leaves to form new compounds, and we can trace to some degree the processes which make our woods so brilliant in October. But, after all, our knowledge is very limited. We all know individual Red Maples, which glow with an intenser scarlet than any of their fellows. It is not at all improbable that if these individuals were propagated, a race or strain of each species could be established in which this peculiarity would become a fixed habit and enable us to a show a mass of Oaks or Maples that would be almost dazzling in the splendor of their foliage. But, on the other hand, these colors may be due to certain soil conditions, and cions of these exceptional trees when grafted on other roots might fail

to kindle into the glowing colors of the parent stock. Would it not be well for nurserymen to find practical answers to such questions as this? Such experiments might be carried still further, and a test could be made with trees propagated from an individual branch whose foliage is known to change every year at an earlier period or to a brighter color than is the case with the rest of the tree. Here are definite points inviting study, and the facts which are ascertainable might help us to enhance the beauty of our parks and gardens for several weeks every year.

Pinus ponderosa.

THE Western Yellow Pine, or *Pinus ponderosa*, is the most widely distributed Pine-tree of the mountain forests of western North America, where it is distributed from the interior of British Columbia, from about latitude fifty-seven degrees north, southward to Mexico and eastward to northern Nebraska, the foot-hills of the Rocky Mountains of Colorado, and western Texas. Usually an inhabitant of dry elevated slopes, where it often forms open forests of great extent, it flourishes also on the western slopes of the Sierra Nevada, in the comparatively humid climate of northern California, where it attains its largest size, and in California also grows occasionally in wet and swampy ground. It is the only Pine-tree of Nebraska, and is very abundant on the Black Hills of Dakota; in northern Montana it forms a great forest in the valley of the Flat Head Lake and ranges westward to the shores of Puget Sound; it dots the slopes of the eastern foot-hills of the Rocky Mountains of Colorado, and clothes the divide between the Platte and Arkansas rivers with a forest pushed far out over the plain. Abundant in similar situations in Utah and common on the eastern slopes of the Sierras, where it attains a great size and beauty, *Pinus ponderosa* has found the climatic conditions of the Great Basin too severe for it, and it does not occur on the mountain ranges of central and southern Nevada. The Colorado plateau, which has an area of many thousand square miles in southern Colorado and Utah and in northern Mexico and Arizona, is covered with a forest of this tree. This is now the greatest uninterrupted Pine forest of the continent, and probably the largest in the world. South of the Colorado plateau the desert is broken up into short ranges of mountains, and on them, on both sides of the Mexican boundary, *Pinus ponderosa* is a common tree, as it is on the mountains of western Texas. A tree of such enormous range over a region of so many different climates has naturally developed many forms, and no other American Pine-tree varies more in size and habit, in the character of bark, length of leaves and size of cones. Sometimes it is fully three hundred feet tall, with a trunk fifteen feet in diameter, covered with bright cinnamon-red bark, broken into great plates, and sometimes it attains with difficulty the height of fifty feet, and its bark is nearly black and deeply furrowed. Such variations in the character of the bark are not always due to climate, however, and individuals with the red bark of the California tree and the black bark of the inhabitant of the arid slopes of the Colorado Mountains stand side by side in northern Arizona to the discouragement of the botanist anxious to understand this tree and the causes of its variations.

One hundred photographs would not be too many to properly illustrate the appearance of *Pinus ponderosa* in the different parts of the country which it inhabits, and an attempt to describe its different forms with any words at our command would be hopeless. Certain characters which botanists consider valuable specifically can be found in all the forms, so that it is most convenient to consider them all geographical varieties of one species, although in size and general appearance and in the character and value of the timber produced they are as distinct as many of the recognized species of our Pines.

The beautiful photographs of the Sierra forests often seen in the east have, no doubt, made the appearances of this

tree, as it grows in its best estate, familiar to many of our readers, but the illustration on page 395 of this issue, made from a photograph for which we are indebted to Dr. W. H. Rollins, of Boston, shows the habit of a group of several young trees of this species, probably one hundred feet high, growing in the Yosemite Valley.

Autumnal Changes in Leaves.—II.

A GREEN leaf, or an alcoholic extract of one, viewed through a spectroscope, shows a band of light, or spectrum, which is very characteristic; its dark intervals or absorption bands, resembling those of no other substance. If, now, we mix benzine with our green solution of chlorophyll which we have obtained by soaking, say, Elm leaves in alcohol, the liquid separates into two layers, the upper of bluish-green benzine and the lower of yellow alcohol. These two solutions give different spectra, proving them different substances. Our chlorophyll, then, was a mixture of at least two substances, or, more likely, a chemical compound which broke into two of its constituent compounds, the yellow one being called xanthophyll. Now, this separation presumably occurs when green leaves turn yellow, as is suggested by a simple experiment. If our alcoholic extraction from Elm leaves has not been kept in darkness and sealed from the oxygen of the air, it has rapidly decomposed, turning from green to yellow—that is, the green constituent fades away first, gradually revealing the yellow one which, by the way, some consider the equivalent of the etiolin that always precedes the first formation of the green pigment.

Chlorophyll, however, is not simply reducible into two components, a green and a yellow, but into several more which it might be tedious and confusing to describe in detail. Over a score of distinct pigments exist in leaves. We may say, though, that an acid added to our original bright green extract turns it to a dull yellowish-green solution giving a new spectrum, and the same change, doubtless, occurs in the Grape leaf and others naturally containing free acid.

Returning once more to our alcoholic solution of chlorophyll, let us evaporate it to a green residue to which we will add water. The water dissolves out a gold-yellow substance which cannot be erythrophyll, for that is insoluble in water, besides having a different spectrum as well as another shade of yellow. This gold-yellow substance, whose name we had better omit, is very prevalent in autumnal leaves of Elm, Poplar, Milkweed and many more, occurring in four or five varieties, as distinguished by their optical properties. It is not always found, though, whereas xanthophyll invariably accompanies chlorophyll. A solution of this gold-yellow pigment in water may readily be oxidized by artificial means into substances with different shades of brown, and the oxygen of air, doubtless, accomplishes the same effect in leaves of Elm, Buttonwood, Beech and many more.

The red colors now remain for consideration. Microscopic examination of a thin cross-section of a red leaf of Japanese Ampelopsis shows that while the bounding wall of each leaf-cell is lined with colorless protoplasm embedded with green chlorophyll granules, the interior of each cell is occupied by a bright lake-red fluid. This cell-sap, as it is called, is mostly water in which is dissolved the red pigment, erythrophyll, if we may add one more technical term. We may obtain this pigment from Ampelopsis, Maple, Huckleberry and other leaves which turn red by boiling them in water, which dissolves out the erythrophyll, rendered impure, however, by more or less of the gold-yellow pigment already referred to. Evaporating the solution gives a red gum-like solid which is found in many of the so-called evergreen leaves that are red. Winter leaves of Cranberry soon lose their water by evaporation and precipitate in each cell a solid mass consisting almost wholly of tannin, either colorless, yellow or colored red by erythrophyll. Tannic acid accumulates in leaves, especially

of Oak, Beech and Sumach, as a probable waste product, and, though almost colorless, is capable of oxidation into bright yellow, red and brown pigments. Now, it is easily verifiable that all leaves red with erythrophyl contain abundant tannin. Not only that, the two substances are closely associated. Although erythrophyl might be formed by the disintegration of chlorophyll, it often appears independent of that substance, and might also be regarded a derivative of tannic acid by oxygen and light. It is only formed in sunlight and first appears in the exposed tips and stems of leaves, as indicated by their color. Again, it is not formed until leaves are in a state of low vitality. A green Sorrel leaf stuck into moist sand has its under side reddened if exposed to sunlight, but not if shaded. When a healthy leaf of White Oak is torn or punctured by an insect or artificially, the wound in either case soon becomes prematurely edged with the maroon of autumn. In the case of the Sorrel, sunlight opens widely the stomata, which mechanically regulate the normal escape of water from the under, shaded side of most leaves. The same uncontrolled evaporation occurs from a punctured Oak leaf. If evaporation is too rapid, however, a leaf dies green without assuming its autumn colors. An abnormal loss of water from the leaves not being replaced fast enough by the roots, implies a loss of vital power and a lessened ability to counteract forces of decomposition.

Weakened vitality, as need hardly be said, is always a necessary preliminary to the autumnal coloration of leaves. Aside from local influences of insects, fungi, soil and other things, all plants suffer a decrease of vitality from the yearly depression of temperature, assisted oftentimes by continued drought. We must not think of chlorophyll as formed once for all in spring and remaining permanent until autumn, but must consider it in constant decomposition and reconstruction, its constituent pigments not only existing in varying relative and absolute amount in different leaves, explaining the diverse colors and shades of different plants, but also occurring in varying proportion in any individual leaf, according to the equilibrium between the constructive and destructive forces in the plant. When this balance is fatally destroyed, as by falling temperature, green pigments are killed by the very solar energy which created them, and previously existing yellows and reds are revealed, or may also be formed in increased amount. Continued action of oxygen, heat and light reduces bright pigments to brown ones, by whose decay valuable mineral matters are returned to the soil.

I have now described in some detail the more important of the many pigments found in leaves and the colors they separately produce, but we must remember that almost any autumn leaf contains not one, but several, distinct pigments, the temporarily predominating one giving the leaf its color. The Red Maple is a good case in point. The yellow gradually creeps from the edges toward the large veins, and has not gone far before the edges shade from orange into crimson, which also works toward the veins. These are the last to turn, often appearing green against a striking yellow or red ground. Again, some Ampelopsis leaves are very dark, yet reveal by the microscope a distinct green pigment and a separate red one. The former absorbs the red rays of the solar spectrum, and the latter the complementary green rays, so that little light is transmitted to the eye, and the leaf looks almost black. Purple Beech leaves show the same thing, but with an excess of the red pigment. In the beet, erythrophyl is a normal, if useless, constituent; but it does not appear in a Blueberry-leaf until the green has given place to yellow; then yellow and red combine optically into brilliant orange and scarlet colors. Purple Beech leaves are never scarlet simply because the red erythrophyl decomposes before the green chlorophyll does, and the same may be said of many other potentially brilliant leaves; yet we ought to be satisfied with the color display nature already gives us.

Endeavoring to explain the principles which underlie this complex subject I cannot do better than to reproduce

		a table by Mr. Sorby, who has made the deepest and most trustworthy researches into vegetable coloring matters:
Complete vitality and growth.	{ Chrysophyll (gold-yellow). Chlorophyll (deep green).	{ More or less bright green. More or less green-brown.
Low vitality and change.	{ Erythrophyl (crimson-red). Xanthophyll (bright yellow).	{ More or less red-scarlet. More or less bright orange- brown.
Death and de- composition.	{ Phaiophyll (brown-orange). Humus (brown-black).	{ Less or more dull brown.

This table gives the shades peculiar to the more important groups of leaf-pigments as classified by Mr. Sorby, and the tints resulting from some of their combinations, as well as the relative vitality of leaves approximately expressed by their colors.

We find all transitions between leaves which die at autumn and those which are again capable of assimilation after persisting dormant over winter. Such so-called evergreen leaves are always provided with an unusually thick and smooth epidermis to protect the chlorophyll grains within. This chlorophyll remains perfectly green during a mild winter, although the leaf may appear red from an abundance of erythrophyl overlying and hiding the green granules, which have retreated inward; or the green may fade away, as in autumn, leaving yellow granules of xanthophyll, and unless vitality is further reduced and the yellow oxidized into brown, such yellow leaves will again become green in the warm days of early spring, and will give the plant a start until the new year's buds have opened.

Here is a good place to tell why leaves fall. Sir Isaac Newton was possibly not aware that his apple fell because it was pushed. Of course, that was not pertinent to his train of thought, although strictly true, for fruits as well as leaves are severed from the plant by a "separating layer." Early in summer a layer of tissue begins to form across the base of each leaf-stalk where it joins the stem. This layer grows down like a wedge from the upper angle of leaf and stem. At first it is soft and does not resist the passage of water, but as winter approaches the layer becomes corky like the rest of the bark of which it is a part. It results that when the leaf, weighted with accumulated mineral matters and strained by frost, wind and rain, finally falls, no raw wound is left, but a scar already healed.

Here is an exquisite adaptation by which water passages are literally "corked up" in anticipation of the fall of leaves that have outlived their usefulness. As this separating layer gradually shuts out nutritious fluids from the leaf, the latter naturally becomes more and more of a prey to decomposing agencies. Yet, before a leaf falls, all its useful contents, like starch, potash and phosphoric acid, travel through the stem into the bark and young wood, as Sachs has clearly shown, to be stored for future need; the leaf is then rejected as of no more use, and its decomposition cannot affect the plant as a whole.

So the colors of autumn leaves are not adaptations for beneficial purposes like the colors of flowers, but are incidental, unaimed at and a wholesale waste of beauty, so far as concerns plants themselves. We must mention, however, that the pigments of many, not all, petals and fruits cannot be distinguished from those of autumn leaves—an additional evidence of similar origin and an example of the adaptation of useless structures to useful purposes, as occurs in other biological fields.

If this unæsthetic explanation of autumn colors sacrifices any poetic sentiment, we can recall the fact that no leaf falls without revealing a bud, the promise of a future manifestation of life.

Cambridge, Mass.

Justus Watson Folsom.

The frosts come to ripen late September days as they ripen a persimmon. Just before sunset a thin haze in the air bathes the mountains on the western horizon with a purple tinge, like the bloom on a fruit. It is a phenomenon which follows the frost, and is an evidence that the year is ripe.—Thoreau.

Foreign Correspondence.

London Letter.

BY the middle of September we begin to notice the touch of approaching autumn here in the aspect of gardens, and already we see the brightening tints of ripening foliage. To-day I noticed in the Kew Arboretum crimson and golden hues developing on many trees and shrubs, chiefly those of American origin. The Tupelo is growing ruddy, and the Missouri Currant is a mass of crimson and gold. The Liquidambers, Azaleas and Vacciniums will presently give us a hint of an American autumn, and upon these rich colors planters must rely for effects in country places at a season when the owners are there. Of flowers, too, there is no lack. The abundance of autumn bloom this year is surprising, and no place excels the displays at Kew, where the warm gravelly soil has been greatly benefited by the heavy rains of the past month. The most striking features just now are the Japanese Lilies, particularly *Lilium speciosum* and *L. auratum*. These are planted freely in broad masses which rise out of Rhododendron or other evergreen shrub-growth. The shrubs make a foil for the flowers, and the damp soil required by the shrubs suits the Lilies. The golden-banded Lilies are especially luxuriant this year. They were grown from bulbs imported direct from Japan, and planted so late as May. The selected bulbs represent the variety known as Broad-leaved or *Platiphyllum*, though they may be only extra-vigorous seedlings of the common *L. auratum* selected with care and cultivated as in the Lily-fields about Yokohama. Whatever the origin of this vigorous form, it should always be obtained, if possible. The mass of these Lilies at Kew is of even height, and does not exceed three feet. The stems are stout and the leaves broad and strongly ribbed. Each plant carries from one to four flowers nearly a foot across the outspread sepals, which are of thick and firm texture, and withstand stormy weather better than those of the ordinary form. The flowers vary from those heavily spotted and blotched to spotless forms with broad bands of golden-yellow down each sepal. This mass will grow much taller and bear more flowers, but, considering the time it has been planted, the result is remarkable. The soil is a deep peat, mixed with leaf-mold and sand to suit the Rhododendrons among which they are planted, and the position is open and only moderately sheltered.

The Tea and China Roses are as remarkable as the Lilies. Among the Tea Roses in abundant second bloom are Marie Van Houtte, Perle des Jardins, Madame Berard, The Bride, Comtesse Riza du Parc, Madame de Watteville, Hon. E. Gifford, Marie d'Orleans, Madame Lambard, Madame Hoste, Jean Ducher and Doctor Grill, a dozen first-rate kinds that have proved to be the most satisfactory for September bloom about London and southward. The China Roses may well be termed perpetual bloomers, for they have been in continuous flowering since the middle of May, and are now more crowded with flowers than earlier in the season. They may be seen at Kew in large masses fifteen and twenty feet across. They are most effective in masses, as the flowers individually are not showy, compared with the Tea and hybrid Perpetual Roses. The best are Camoens, Laurette Messiny, the old Fellenberg, Jean Siseley, Cramoisi-Superieure, White Fairy, and White Pet and Red Pet. The last three are thickly set with buds and will continue to flower for another month.

At the Royal Horticultural show at Chiswick this week, Messrs. Paul, of Waltham Cross, showed a large collection of Roses that may be relied upon for September and October flowering, if frosts are not severe. Besides those already named, their collection included such fine sorts as Mrs. John Laing, one of the best autumn Roses of its color, and the flowers were of as good quality and size as in July; Countess of Pembroke, another of Bennett's hybrids, and Augustine Guinoisseau, known as the White La France. These three kinds were particularly fine. One of the most beautiful of the miscellaneous sorts was the double White

Rosa rugosa (*Blanc double de Coubert*). This is probably the purest white of all Roses, and there is a massiveness about the large semidouble flowers that makes it effective in contrast with the broad green foliage. The variety of *R. rugosa* called America is exciting a good deal of interest; its large crimson-lake flowers are brighter than the ordinary rugosa, but it does not seem to be very distinct from the original.

The show was mainly devoted to vegetables, but there were no new ones or any that were specially noteworthy. The floral exhibition was principally of Dahlias, which are the flowers of the season, and the principal cultivators of these flowers seem to have made an effort to surpass one another on this occasion. One collection, from Mr. Ware, of Tottenham, was fifty feet long by five feet deep, and all classes of the flower were represented. The prevailing fashion among Dahlias is for the Cactus-flowered sorts. They comprised two-thirds of the exhibits, and some of the new kinds were certainly beautiful. Nothing can excel in brilliancy the vermillion-scarlet novelty Miss Nightingale, the rich saturn-red of Mrs. Wilson Noble, and the glowing scarlet Miss Annie Jones. The committee considered these all worthy of awards of merit. Among the older yet not common Cactus sorts were the lovely delicata Minnie, pale pink; Miss Beck, pale orange-scarlet; Mrs. Francis Fell, white and pale yellow, and Mrs. Charles Turner, the latter the largest Cactus Dahlia I have seen and of a pure chrome-yellow. As a bold vase flower at this season nothing could be finer. There were some good new kinds among Pompon and show Dahlias, but nothing striking, and there seemed to be no new kinds in the decorative section. These, though not suitable for the exhibition table, are most effective in gardens if planted in bold masses, since the flowers stand up away from the foliage, unlike the partially hidden flowers of the Cactus sorts. The best among the decorative Dahlias is the brilliant scarlet Flambeau, or Glare of the Garden, as it is also called.

Only a few Orchids were shown, but these were choice and consisted of new hybrids from Messrs. Veitch, the result of the careful work of Mr. Seden. A certificate of the first class was voted to *Laelio-Cattleya Clonia superba*, a cross between *L. elegans* Turneri and *C. Warscewiczi*, which is undoubtedly one of the finest hybrid Orchids yet raised. The flowers are as large as those of *C. Warscewiczi*, with a similarly broad labellum, but of a more intense crimson, while the sepals, which stand out firmly, are more in the way of the *Laelia*, being of a rich rosy-purple, veined with a deeper hue. An award of merit was given to *Laelio-Cattleya Eunonia*, a cross between *C. Gasckelliana* and *L. pumila* Dayana. It has the dwarf compact growth of the latter parent. The flowers are much larger, with pale rose-pink sepals and an intense crimson lip, with an orange blotch and light-tinted margin. A similar award was voted to *Laelio-Cattleya Parysatis*, between *C. Bowringiana* and *L. pumila*. This has also the dwarf growth of *L. pumila*, with larger and finer flowers more richly colored. *Laelio-Cattleya Nyssa purpurea*, between *C. Warscewiczi* and *L. crispa*, is a beautiful hybrid with flowers larger than the typical *L. crispa*, and with the same characteristic white frill to the labellum. These four hybrids are the finest group that has been shown at one time by this firm. A very remarkable hybrid *Cypripedium* was also shown by Messrs. Veitch. It is the result of intercrossing *C. Haynaldianum* and *C. Spicerianum*, and has the characters of both parents strongly marked in the flower. The dorsal sepal is that of *C. Spicerianum*, but the lateral sepals are like those of *C. Haynaldianum*, while the lower sepals, instead of being joined in the usual way, are separate and stand at an angle between the lateral sepals and the upper ones. The lip is like that of *C. Spicerianum*. This singular and beautiful hybrid is named *C. Carnusianum* (Veitch's variety), and the committee was unanimous in voting it an award of merit. Another hybrid, called *C. Melis*, between *C. Philippinense* and *C. villosum* Boxalli, was not remarkable, as it was too much like the latter parent.

Kew.

W. Goldring.

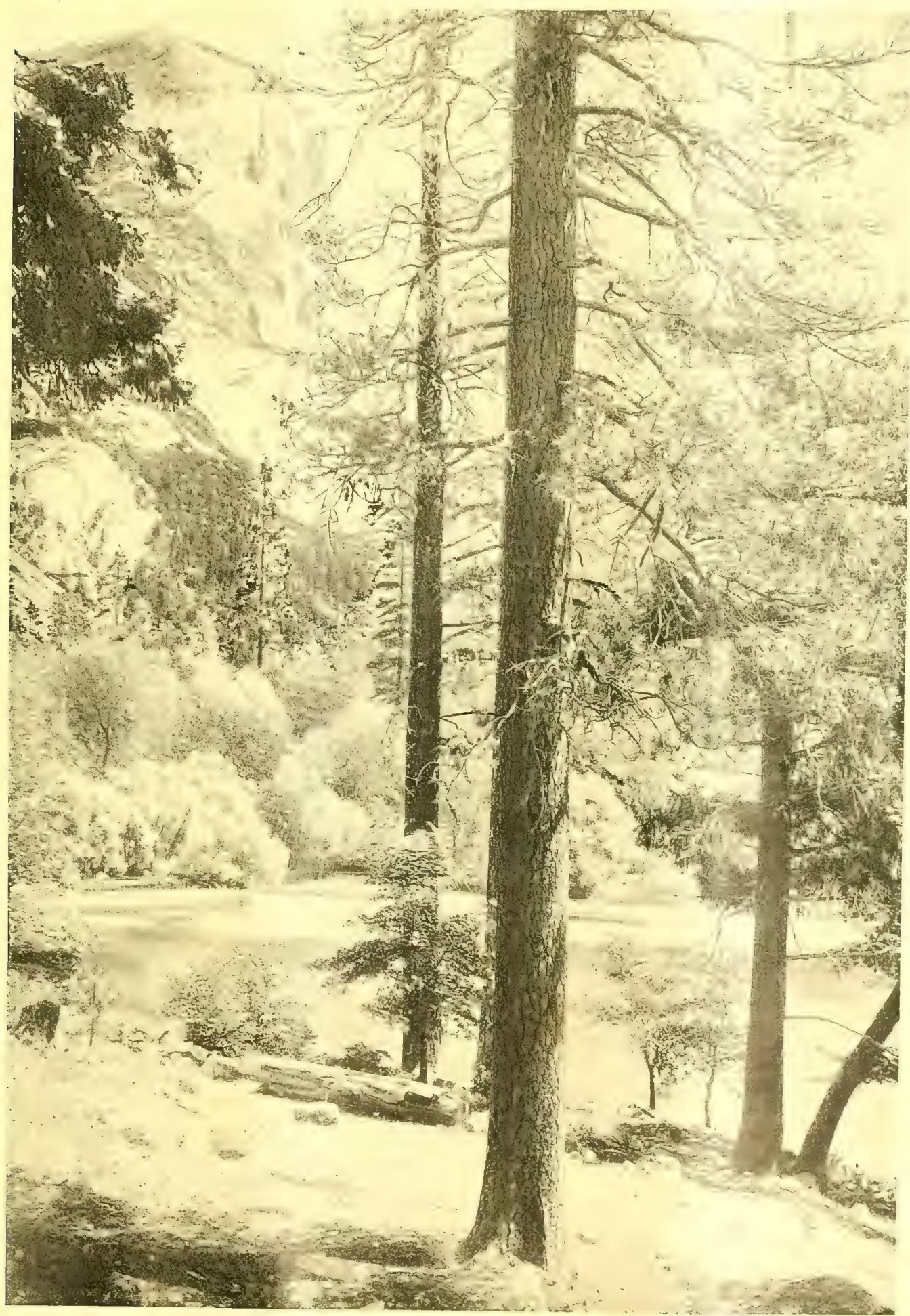


Fig. 54.—A group of young *Pinus ponderosa* in the Yosemite Valley.—See page 392.

Plant Notes.

ACER PENNSYLVANICUM.—The Striped Maple is one of our common small trees in the interior and mountainous parts of the Atlantic States, growing as far south as Georgia, and reaching its largest size on the Blue Ridge in the Carolinas and on the Big Smoky Mountains of Tennessee, where it is sometimes forty feet high, with a short stout trunk ten inches in diameter. Generally it is a much smaller tree, and often is little more than a large shrub. It derives its common name of Striped Maple from the pale or bluish white longitudinal striations on its reddish brown or green smooth bark, and we have no other hardy tree whose stems and branches are more delicately handsome, for, although some other Maples have more brightly colored branchlets, they lack its peculiar beauty of the main stem and large limbs. We rarely see good specimens in parks or private grounds, for it has been too much neglected by planters, but, when well grown, this Maple has a singularly neat habit, with light green summer foliage, attractive bud-scales and young leaves in early spring, and clear yellow leaves in autumn. The flowers, too, are graceful, hanging in long, drooping racemes. Altogether, it is an admirable tree for planting, like so many other of the smaller trees in our forest flora. The tree is also called the Moose Wood, because the deer browse in early spring on its young shoots, when they are filled with a sugary sap. Michaux found that when grafted on the Scyamore Maple it grew to a much larger size than when left on its own roots. The Japanese *Acer rufinerve*, which has been cultivated to a considerable extent, is so closely akin to the Moose Wood, botanically, that they can hardly be distinguished. *Acer spicatum*, our Mountain Maple, is a still smaller tree of more bushy habit, which we have often commended for large shrubberies. It is still more rarely grown than the Striped Maple. Its upright racemes of flowers and its bright red fruit in July are attractive features of this tree.

CALICARPA PURPUREA.—This shrub is just beginning to justify its generic name by the beauty of its clustered berry-like drupes which appear in the axils of every leaf. As seen in our parks just now, the branches, often three feet in length, arch over almost to the ground under the weight of violet-colored fruit, and this, together with its clean light green foliage, makes the plant worth using in parks or large places, wherever it is desirable to produce special autumn effects. The flowers open in mid-August here; they are lilac-purple, but small and inconspicuous, although rather interesting, on account of the time when they appear. This shrub, which grows to a height of four or five feet, is a native of Asia, but there is an American species of the genus found from Virginia southward along our coasts. It is not hardy as far north as New York, but where it will thrive its violet-colored fruit is even more handsome than that of its Asiatic relative. *Callicarpa purpurea* can be raised from seed, which is produced abundantly, and it will grow in almost any soil and with the simplest treatment.

LILIUM HENRYI.—This Lily was sent by Dr. Henry to Kew from China, where it flowered for the first time in 1889, and as soon as the plants became established it at once took rank among the best of Lilies for the garden. Mr. Nicholson wrote us, two years ago, that it would grow both in peat and loam, although it appears to gain a greater size when planted in loam. Mr. Orpet, who recently saw it flowering in Kew, writes that in habit and vigor it equals strong specimens of the Tiger Lily, and it has this Lily's umbellate habit of flowering and does not branch in an irregular way like *L. speciosum*. The flowers, however, resemble those of the latter species so closely in form that it has been called the yellow *speciosum*. The color is really apricot, with chocolate spots. Plants in the open border at Kew are more than seven feet high, many of them carrying thirty flower-buds each, and they presented a magnificent spectacle about the end of August. It is to be

presumed that this Lily has now reached the full size it will attain at Kew, but when the bulbs are cheaper and have become more widely disseminated and tried under different conditions, it is possible that the plant will attain still larger proportions.

Cultural Department.

Late-blooming Hardy Herbaceous Plants.—I.

THE value of hardy herbaceous perennials is most noticeable at this season, for, in spite of the loss of tender plants, there is an abundance of hardy material to give an effective fall showing up to the time when the ground is frozen. Many hardy plants are not affected to a noticeable degree by frosts that would kill Geraniums. After two nights of hard frost that has killed all Squash and Tomato plants and has rendered unprotected Geraniums past further use, although no effects of the injury are seen in the foliage, the promise of bloom among hardy plants is still bright.

Achillea Ægyptica, *A. millifolium*, var. *roseum*, and *A. serrata*, Pearl, are throwing up quite a show of second bloom, and *A. Eupatorium* is displaying umbels of rich golden-yellow flowers from four to five inches across.

Aströmeria aurantiaca, the Peruvian Lily, still shows a wealth of its showy clusters of rich yellow, chocolate-striped flowers. *Anchusa Italica*, having been relieved of its seed-vessels before ripening, is giving many branched spikes of rich blue and white flowers resembling forget-me-nots. *Anemone Japonica* is at its best in all its pink, rosy purple, white and semidouble forms. *Aplos tuberosa*, as a cultivated plant, is still producing its richly fragrant clusters of chocolate and red flowers. A single clump of *Asclepias tuberosa* (the Pleurisy-root) has been in bloom since mid-June, and shows no sign of stopping. *Asperula odorata* has taken on a second growth after the abundant rains, and there are enough flowers opening to spread its characteristic fragrance about.

Asters are in perfection, and these are some of the best: *A. Sibiricus*, a dwarf narrow-leaved species not exceeding a foot in height, forming a globular head covered with small clear lavender, starry flowers; *A. longifolia*, some three feet high, with rich deep bluish purple ray-flowers and well-defined bright yellow centres; *A. Chapmanii*, forming a bush some four feet high and quite as broad, with an open angular-branched habit and a profusion of fine clear blue flowers; *A. Novæ-Angliae*, two to three feet in diameter, and just beginning to display its rich purple flowers by the hundred; its variety, *Rosea*, with a welcome contrast of color in its clear rosy red flowers while the varieties offered by the European nurserymen under the names of William Bowman and Constance are hardly distinguishable from the typical form; *A. spectabilis*, a splendid medium-growing species with broad, open, flat heads of large, rich, deep blue flowers; *A. multiflorus*, displaying myriads of minute white flowers in immense panicles; *A. acris*, just passed its season, but a plant not to be omitted from any good list of Asters because of its compact upright habit, being three to four feet high and not at all weedy, with clouds of well-formed pure white flowers each an inch across; *A. grandiflorus*, now forming buds for later bloom, and, although hard to grow into a specimen plant, its abundance of bloom so very late in the season and its individual flower-heads, an inch and a half across, of the richest deep blue color, give it great value; *A. ptarmicoides*, now past its best, after a brave show of small pure white flowers in densely branched heads; *A. Novæ-Belgii*, var. *Lady Trevilyan*, now at its best, with immense panicles of bloom often two feet and a half long and a foot to fifteen inches in diameter, each composed of innumerable pure white starry flowers.

Boltonia latisquama is a veritable queen among the autumn-blooming perennials, twelve-months-old clumps now giving masses of bloom fully five feet through, composed literally of myriads of rich clear lavender-pink flowers individually an inch and a half to two inches in diameter, and each on a clean wiry stem. Without exception, this can be given first place among the September-blooming perennials; the more commonly planted species, *B. asteroides*, with pure white flowers, does not give such great wealth of bloom, and the flowers are smaller, yet it is a showy plant.

Callirrhoë involucrata, the Poppy-mallow, has not been out of bloom since early June, and continues to throw out fresh shoots and an abundance of rich velvety purple buds opening to rich reddish purple, cup-shaped flowers an inch and a half across. *Catananche cœrulea*, in all its forms of clear purple, blue, purple and white and pure white flowers, has started afresh, and *Cedronella cana* is in perfection with its long

spikes of rich purple, pungently fragrant tubular flowers, the plant forming a bush three feet high and nearly as much in diameter. *Centaurea montana* and its red and white varieties, particularly the latter, are giving occasional flowers, which are eagerly sought for bouquets. *Chelone Lyonii* is just passing its best, but it continues a conspicuous object, forming strong bushy specimens three feet high and quite as broad, with rich green foliage to set off its dense heads of showy reddish purple flowers. This can be reckoned among the best of the late summer and early autumn bloomers. *C. obliqua*, var. *alba*, both in the garden and in its native meadow localities, makes a fine show in spite of the cold nights it so bravely endures.

The early-blooming Chrysanthemums are now making a good effect, particularly such of the earliest forms as Golden Fleece, bright yellow, double, and *La Petite Marie*, double, white, tinged with pink in fading. Captain Nemo, rich purple; Luxemburg, bronzy red; *Precocité*, yellow; *Souvenir d'une Amie*, snow-white, and *St. Croix*, white, tipped with pink, are just beginning to open, and they will bloom until the ground freezes hard.

Clematis crispa is still opening its wax-like, bell-shaped, lilac-colored flowers, and *Conoclinium coelestinum*, the Mist Plant, is in perfection, forming spreading clumps a foot and a half high, with handsome foliage and every branchlet ending in a cluster of rich blue *Ageratum*-like flowers. *Coreopsis lanceolata*, *C. grandiflora* and *C. tripteris* are now giving ample second bloom, and although not needed so much as in early summer, on account of the abundance of yellow flowers at this season, yet they are always desirable. *Delphinium Chinensis* and the hybrid Larkspurs, in all their forms, after being cut back to prevent them from seeding, are now again in bloom, with smaller spikes. *Lespedeza Sieboldi* is now in perfection, every one of its lithe branches arching under the weight of its pendulous racemes, of rich red and purple, and in one variety pure white, pea-shaped flowers. *Dicentra spectabilis* has been sending up a second and rather unseasonable bloom of late, but our old favorite, *D. eximia*, is still giving a brave effect of bloom to contrast with its handsomely cut foliage, always so useful with cut flowers, and its variety *Multipinnata*, with its fresh green, beautifully compound foliage, is a rich sight among the waning foliage of other ripening border plants.

Of the Gentians, *G. alba* and *G. Andrewsii* are now exceptionally good, making strong clumps two feet or less high, the former with showy clusters of creamy white flowers, the latter with rich purple-tipped white, closed flowers. *Gypsophila repens* still forms creeping masses of glaucous narrow foliage, with broad heads of white flowers tinged with pink; and *Helianthus laevis* is throwing up a second growth of its orange-yellow flowers, while the form known as *H. Pitcheriana*, of dwarfer growth, is a marvel of beauty with its fine formed flowers of deep orange.

Tritomas, though barely coming under the head of hardy plants, but which, if properly treated, will prove such, now give some of our best garden effects in their towering spikes of crimson, vermillion, red and orange flowers, fading with age to shades of yellow. *Lathyrus latifolius*, the Perennial Pea, and its white variety show occasional flowers, the white form displaying more freely its dense clusters of pure white on stiff wiry stems, which make it one of the best for cutting purposes. *Lepachys pinnata* still makes some floral show with curiously drooping lemon-yellow petals, so oddly different from the rigidly upright habit of the plant.

Linaria Dalmatica has bloomed since early June and bids fair to continue until hard frost, a great improvement on the wild Butter and Eggs (*Linaria vulgaris*) of the roadsides, growing some two feet high and producing showy branched spikes of yellow and orange flowers. *Lotus corniculatus* is again displaying dense globular heads of bright yellow, orange-tipped flowers above its narrow-tufted foliage. *Lobelia cardinalis* is about past, but a few short spikes of rich cardinal flowers continue to make bright spots in the border. *L. syphilitica* is in perfection with its long showy spikes of rich, clear blue flowers. *Lychnis Chalcedonica*, in its double white and double scarlet forms, is making good second bloom; both are first-rate additions to hardy plants and superior to the typical form, growing slowly into spreading clumps three feet high. The double Campion, *L. vespertina*, after a short rest, is again flowering, and is a boon to the florist, with its wealth of fragrant, showy double white flowers.

Myosotis palustris, var. *semperflorens*, the ever-blooming Forget-me-not, has been in bloom since spring, but now that cool evenings are here is outdoing itself, forming broad-spreading clumps, with masses of showy, light blue, white and yellow eyed flowers. This is the most satisfactory of the perennial Forget-me-nots. *Oenothera macrocarpa* keeps up

its constant succession of immense trumpet-shaped, fragrant, rich yellow flowers, individually three to four inches across. As a plant for the front of the border or for the rockery it is unexcelled and always attracts attention. *O. speciosa* also persists in producing pure white fragrant flowers and forms a bush 18 inches high and as much through. Unfortunately this requires considerable care to carry it through the winter.

Reading, Mass.

J. Woodward Manning.

Autumn Garden Flowers.

THE unseasonably warm weather of the past fortnight has given a new lease of life to all autumn flowers. Seldom have the roadsides, hillsides and meadows been so bright at this season of the year. The native Asters and their allies, the Boltonias, are abundant everywhere, with late-blooming Sunflowers and Golden-rods in perfect harmony of color.

In the garden, with exotics to draw upon, we have still more variety. Gladioli and the late Japanese Plantain Lily have past early this season, but Dahlias, single and double, and especially the Pompon varieties, are at their best. So, also, are the common but showy double form of *Helianthus decapetalus* and the silver-leaved Texan Sunflower, *Heianthus argophyllum*, which is the best of all the annual Sunflowers. *H. cucumerifolius* is a neat variety and excellent for cutting; it blooms earlier and is beginning to look seedy now. Montbretias will hold on until frost, which always comes too soon, as many of our showiest plants begin to flower quite late in the season. Japan Anemones in the open ground are scarcely yet at their best. They would have flowered earlier if the crowns developed the previous season had not been winter-killed. Sometimes we are fortunate enough to have a few escape freezing, but usually new crowns have to be formed. We have yet to find a way of protecting them, as ordinary litter does not answer. Dryness at the roots seems the essential condition, as some few plants kept in a cold frame, with no more protection than shutters, came through just as safely as those stored in the barn-cellars. These plants when grown in large pots make excellent specimens for piazza decoration. They are now in full bloom.

During the flowering season of *Clematis paniculata* letters of inquiry are always received about the best way to raise this plant from seed. The seed should be sown in autumn rather than in spring. I have seen many plants raised in the open ground which had been sown in autumn and covered over winter with about one inch of litter. Light sandy soil a half inch deep is best for covering the seed. The seeds are slow in germinating, and may not be expected until the following July. The beds must be kept well watered the entire summer. Persons who have bought seed in spring have been disappointed in apparent failure to germinate. The seed may not come up until September, but if the soil is kept moist they are sure to come. The seed-bed should not be disturbed until the following spring; it should be covered with litter as before, but less deeply.

Cannas continue to flower well. There are none more beautiful than *Souvenir d'Antoine Crozy*, with its brilliant scarlet ground and wide border of deep yellow. Among the many exotic annuals few are as attractive as *Vinca rosea* and its white variety when used in mixed bedding. It is of neat and even growth, about eighteen inches in height, and never at any time unsightly. In order to succeed thoroughly with this plant the seeds should be sown in a warm greenhouse about midwinter. The plants will make no substantial growth until put into a hot-bed in March; bottom-heat seems necessary to start them into healthy growth.

Caryopteris mastacanthus, a reintroduced member of the Verbena family, and new to many of us, promises to be an excellent autumn bloomer. It makes a fine effect when massed. It is a neat bushy plant, evidently a subshrub, with self-supporting stems and handsome hoary foliage, being distinctly silvery on the under surface. The flowers are small, labiate, with a fringed lower lip, in fastigiate cymes in the axils of the opposite leaves, lavender-blue in color, and produced in great abundance. I have also grown *C. mastacanthus* as a pot-plant with good results. It may be quite easily increased from cuttings, and, no doubt, will soon be abundant.

Two plants which have pleased me much this summer are *Malva alcea* and *Sidalcea candida*, both near relatives of the Marsh Mallow. *Malva alcea* has handsome palmate leaves, and with a little training or trimming away of straggling shoots makes a splendid pyramidal specimen, blooming from June until frost. The flowers are rotate, slightly incurved, or saucer-shaped, and pink in color. The habit of the *Sidalcea* is somewhat similar, but it is taller, reaching six feet in height in rich

soil. The plant blooms later, and the flowers are slightly larger and pure white in color.

There are also several species of Hibiscus which, though coarse in habit, are very showy at this season. *H. militaris*, blush-white; the common *H. moscheutos*, rose, and *H. coccineus*, a southern species, are among the best. The Cardinal-flower, *Lobelia cardinalis*, is a splendid plant for late effect. Although naturally found growing in moist situations, it succeeds well in ordinary garden-soil, sowing itself freely on our rock-garden.

T. D. Hatfield.

Cannas.

TO an inquiry about the treatment of Cannas from autumn until bedding time, Mr. J. I. Donlan makes answer in *The Florists' Exchange*, from which we quote:

See that the Cannas are well attended to now; they require plenty of water, and once in a while some liquid-manure. Remove all faded leaves and flowers, and cut down to an inch above ground all the stalks that have bloomed; this relieves the plants of sustaining useless growth, and gives them a better chance to form healthy roots. See that all the varieties are properly labeled, and if there be any poor kinds throw them away; do not propagate varieties with inferior flowers. Leave Cannas out-of-doors as long as possible, or until the foliage is cut by frost; a little frost will do them no harm, provided it does not touch the roots, and Cannas make much of their most valuable growth during the cool, moist weather of late fall.

When lifting the roots be careful not to damage the tubers or eyes; shake the soil off and cut all the foliage down to three or four inches from the roots; pack all the roots closely together on a moist, sandy bottom, underneath any greenhouse bench, or in a cellar—anywhere where they will not get frozen or be dried out. Many gardeners lose their Cannas by putting them on dry shelves; the best place to store them is on a cool bottom, away from excessive dryness and continuous drips; they can be preserved in such a place for any length of time. A well-grown Canna should produce from seven to ten new eyes, and commercial growers usually are satisfied with this self-propagation, dividing the roots and selling the surplus all through the winter and spring, as the opportunity occurs.

Where, however, certain kinds are scarce, or it is desirable to work up stock of some new variety, then after the plants are taken up in the usual way all the good "eyes" are cut off and packed in shallow flat boxes with wet moss firmly pressed between them. If the box is placed where it will get a little bottom-heat the tubers will soon commence growing; then the new stock should be placed on a bench filled with rich soil and plenty of well-decayed manure in rows about eighteen inches each way. Give them the same treatment as American Beauty Roses require, with much more water. As the new tubers form, they can be cut off and treated as above, and when rooted they can be put into three-and-a-half-inch pots, shaded for a few days, after which they can be moved into larger pots or tubs, where they will make splendid decorative flowering plants.

If Cannas are started in this way, immediately after they are taken from the field, they should be in bloom at Christmas or New Year's, and can be kept in bloom all winter. If it be only desirable to get plants in good condition for spring planting they should be started in February, March or April. The growth can be regulated by temperature and moisture. If kept as near the glass as possible they will grow more stocky.

Cannas should never be planted out directly from winter storage. In order to get the best results they should be started and put in pots, from which they should be put into well-manured beds the last week of May or first of June.

Hypericum Moserianum.—All things considered, this appears to be the most desirable of the hardy Hypericums for garden culture, and there is little reason to doubt its hardiness, although it has not been tested here in a large way as yet. A large circular bed at Kew, in the decorative part of the grounds, was one of the principal features there this summer, and for massing in this way it is difficult to imagine anything more striking. The large yellow flowers are produced in great profusion for a long period, with a setting of healthy dark-green foliage below. As has already been explained in *GARDEN AND FOREST*, this plant is a garden hybrid between *Hypericum patulum* and *H. calycinum*, the old St. John's Wort, and in general appearance it resembles the latter, but has lost the coarseness that used to characterize that plant and relegate it to waste corners of the garden where nothing else would

grow. At St. Albans, Messrs. Sander have a variegated sport of *H. Moserianum* called Tricolor, which will be highly prized when it is disseminated by all who admire plants with foliage of varied colors. The leaves of this plant are bright pink, white and green, and it has a vigor equal to that of the parent plant, with which it is identical, except for the color of the leaves. These should not burn in this climate as many highly colored sports are apt to do, since the texture is thick, almost leathery, and this ought to insure it against injury even in the hottest seasons. The happy idea of planting this *Hypericum* in masses, as carried out at Kew, is worthy of imitation, as individual plants, either of the type or of the sport, are quite inferior in effect to large groups.

South Lancaster, Mass.

E. O. Orpet.

Correspondence.

Poisoning from Rhus.

To the Editor of GARDEN AND FOREST:

Sir,—I have been following with interest your articles on *Rhus Toxicodendron*, being a sufferer from its poisonous influences. The recent article from Professor Burrill has especially interested me, and has led me to add my own experiences.

When only eight years old, before I knew the properties of this plant, I was badly poisoned. I sat for nearly half an hour in the midst of its leaves and stems, and even whittled the wood. On the next day I was seriously poisoned, an experience which only those who have been similarly afflicted can appreciate. But the trouble was not finally over when the attack had run its course, and this note is to put on record a phase of the poisoning which I have not yet seen recorded.

For the remainder of the year I was well, but late in the spring of the following year, a little earlier in the season than the date of the first attack, I was again poisoned. It was supposed, of course, that I had again come in contact with the plant, for the symptoms were the same, only less severe. No plants, however, appeared to be growing in our neighborhood, and I could recall no ramble in which it was likely that I had been near one. I soon recovered from this attack, and the cause of it remained unknown. But the following year, at precisely the same season, the trouble again appeared, and no possible chance for new exposure could be imagined. There remained but little doubt that the cause of this attack was the severe poisoning of two years before. The disease was not serious, but sufficiently severe to be very troublesome. I am certain of the time of the year in which the attacks came, for in this and the preceding year the orioles were building their nests.

The fourth year the entire family were on the lookout for the disease. I was extremely careful not to come near the Ivy, for by this time I knew the plant and feared its properties. At the usual date, however, the effects of the poisoning were once more experienced, with nearly their past severity. The fifth year, and again the sixth the poisoning recurred, each time in somewhat less severe form. During the summer of my thirteenth year I had typhoid fever, which kept me an invalid until well into the fall. The following spring was passed without a trace of the Ivy poisoning, and the next year I again escaped the trouble. This was ascribed, correctly or otherwise, to the action of the fever, which is supposed sometimes to leave patients in better physical condition than before its appearance.

After two years of freedom I had little fear of poisoning and frequently passed close by the plant, even walking through patches of the low-growing form. I thought myself exempt from its influence, and to make sure rubbed a part of a leaf lightly upon the back of my hand. Of course I was poisoned, and in the following years the same experience was passed through. The attack invariably occurred upon the approach of warm weather, or after I had been overheated. In more recent years these effects seem to have left me entirely. Although susceptible to the influence of the plant when I touch it, I can approach it with impunity, and have often safely passed through large quantities of it when not coming into direct contact with it.

Whatever may be the cause of the disturbance, it has, in my case, regularly been brought into activity by change from cold to warm seasons. This was plainly shown in the winter of 1881, when I left Michigan early in January and went to Florida. I had scarcely been in the warm climate a week when the well-known symptoms made themselves manifest. The following spring they again returned.

I have noticed no mention of one painful concomitant of Ivy poisoning in my case, that is, the appearance of boils after

each attack, and the more severe the poisoning the greater their number.

Cornell University.

[We have received a letter from Mr. Joseph Meehan, of Germantown, in which he speaks of an exact repetition of Mr. Lodeman's case; that is, a friend of his in Philadelphia was poisoned badly by *Rhus Toxicodendron* when on a visit to the country, and for several years afterward at the same season of the year, even although he did not leave the city, the effects of the poison appeared again, severely at first, but in a less aggravated form from year to year, until it finally ceased to reappear. Mr. Meehan adds that he is convinced that he has suffered in the same way, although he cannot be absolutely certain that he was not exposed to the poison the second time.—Ed.]

E. G. Lodeman.

Glimpses of Ventura Gardens.

To the Editor of GARDEN AND FOREST :

Sir,—One of the most charming towns of the Pacific coast is Ventura, of old christened San Buena Ventura, and surely it was an especially good venture of the Franciscan Mission-builders that led them to this narrow crescent of sheltered land, sloping south to the Pacific and guarded from storms by mountains and islands. In the first week of September I visited the place and found it full of surprise and pleasure. No portion of California will better justify a horticultural pilgrimage.

Two Date Palms, planted by the priests, yet remain in the old garden of the Mission. The church-bell still stands in vines and trees, swinging from ancient cross-bars, and the old Mission building gives the quaint town a peculiar beauty of its own.

It is hard to say what trees and flowers do not thrive here, so surprising is the range of species. One passes a *Ficus elastica* tree, for instance, in an old garden; the tree is twenty-three years old, and it has a trunk that girths four and a half feet. The spread of its boughs covers a circle whose diameter is fifty-five feet, and it is twenty-five or thirty feet in height. It is a tree of astonishing beauty and form, and the town of Ventura should buy the ground so as to name and care for it.

The most attractive and interesting garden here is that of Mrs. Theodosia B. Shepherd, who is a well-known hybridizer of various flowers. The advantages of location are great, but she has shown uncommon skill in utilizing those advantages, and her name is now prominent among California growers and experimenters. One of the first things of importance I noticed here was her new Begonias. Mrs. Shepherd has a very large collection of fibrous-rooted species, and after numerous experiments is now rejoicing in a strain of attractive hybrids of *Gloire de Jouy* × *rubra*. This new production is really a race of giant Begonias, some of which send up canes six or eight feet high, with rich, lustrous, metallic leaves, often fifteen inches long by eight inches wide. The glossy and brilliant-hued flowers of immense size, far surpassing the parent types, hang down in long, open panicles of rose, rose-red or coral-red. Nothing could be finer for use as backgrounds in Begonia houses. Three varieties have been named Fair Rosamond, Heart's Delight and Modjeska. The Begonias are grown in the ground here, but are sheltered by lath-houses which shut off about one-fourth of the light at all seasons, and, being partly covered with delicate-leaved vines, at times shut out fully one-third of the sunlight. In more inland situations these lath-houses, or open sheds of slats, should shut out as much as one-half of the light. They are becoming more generally used in California gardens for Ferns and many classes of plants besides Begonias.

Growing out-of-doors, without protection, and flowering to perfection, I took especial note of the following vines: *Bignonia venusta*, *B. magnifica*, *B. siderafolia* and *B. Tweediana*; *Bougainvillea glabra* and *B. spectabilis*; *Ipomoea Learii* and many other Ipomoeas; *Passiflora incarnata*, *Tacsonia Von Volxemii*, *T. Buchananii* and a noble *Tacsonia* which is possibly a cross between the scarlet and the pink varieties, called by Mrs. Shepherd, *T. Sutherlandi*. There is also a grand climbing *Solanum* from Mexico, one of the most picturesque of tropical vines. Nowhere else in California can be found finer specimens of some of these beautiful vines, and they form one of the most memorable features of the place.

A plant of *Cereus triangularis*, which has climbed to the top of the two-story house and far up the slope of the roof, has wide fame throughout California. Planted out in the garden are many of the finest Cacti. I noted two species of the spine-

less *Anhalonium*, eight species of *Cereus*, two of *Echinopsis*, six of *Echinocereus*, five of *Echinocactus* and many of other classes. Especial attention is being paid to the edible-fruited Cacti, and these, as well as others, are being crossed on a large scale, so that great numbers of seedlings are coming along.

All experiments are not made out-of-doors, however, even here. Several well-kept propagation-houses and greenhouses for tropical plants contain large collections. Some Orchids do well out-of-doors in summer hung against the trunks of trees. *Laelia anceps* has grown and bloomed for three winters in such a location.

Among the striking specimens here is a plant of *Streptosylon Jamesoni*, from Central America, an evergreen bush twelve feet high and fully as broad, which blooms from March to October. Its effective Browallia-shaped flowers of bright orange, changing to cinnabar-red, are produced in great profusion. There is an *Erythrina Crista-Galli* tree that stands about sixteen feet high, with branches covering a circle thirty feet in diameter, and a double trunk, either stem of which is ten or twelve inches in diameter. Nearly three acres in the home garden, and five or six acres in other parts of the town, are devoted to the growth of plants and seeds. I cannot even mention the new varieties of Fuchsias, Abutilons, Cannas, Gladioli, Cosmos and many other species of flowering plants which Mrs. Shepherd has originated here. She is working with tireless energy and passionate devotion, much as Luther Burbank, of Santa Rosa, works, and no other woman in California has done as much in this field.

Niles, Calif.

Charles Howard Shinn.

Recent Publications.

Chrysanthemums and Their Culture. By Edwin Molyneux. London. 1894.

The American Chrysanthemum Manual for 1895. Michael Barker. Mayflower Publishing Co., Floral Park, New York.

The first of these books is the eighth edition of the standard work of Mr. Molyneux, who has done more, probably, than any other man to establish what is recognized as the best practical system of growing Chrysanthemums. This last edition of his book contains, in addition to the original text, lists of the newer varieties and gives some of the latest improvements in the methods of cultivating the plant. Of course, the book is written, primarily, for English gardens, but the rules for managing plants for various purposes, the methods of potting and training, together with all the other details of culture, will be found laid down here with clearness and with a freshness which distinguishes the work of an original investigator and experimenter. There are annual Chrysanthemum shows in every town of any size in England, and a first prize there is still a much-coveted honor. It is not wonderful, therefore, that a large portion of this book should be devoted to the methods of preparing plants and flowers for exhibition, and we are not surprised to see the pictures of forceps, brushes and other appliances for "improving" flowers that are to be exhibited, and a discussion as to the proper size of the tweezers and of the material out of which they should be constructed. We hardly consider operations of this sort an essential part of Chrysanthemum-growing, but no one who wants to familiarize himself with all the refinements of the art of growing and exhibiting the queen of autumn can afford to be without a copy of this well-known manual.

Mr. Barker's book is the first one of what promises to be a series of annual publications, and it is certainly well done. The book contains many things that are not worth putting on record, but it also contains much instruction by recognized experts. Such men as Edwin Lonsdale, E. G. Hill and William Tricker write about planting in beds and benches. Mr. T. D. Hatfield explains how he has trained the specimen plants with which he has so often won prizes in Boston. Professor Halsted writes of fungous diseases, while James Brydon, John Dyer, Grove P. Rawson, James Scott and John N. May discuss various phases in the cultivation of these plants, of which they are recognized masters. Mr. E. O. Orpet makes a sound plea for cultivating such neglected groups as the Anemone-flowered Chrysanthemums, and single-flowered ones like the variety called Daisy, which really

makes one of the most beautiful of flowering plants; and Mr. Patrick O'Mara, in the same strain, objects to estimating the value of varieties simply with regard to their fitness for cut flowers. "Horticulture," he writes, "is broader than the cut-flower market," and there is room without crowding out the cut-flower varieties for others with pompon flowers, single flowers, tasseled flowers and other quaint forms. It is true that the most perfect flowers and plants can only be raised under glass, but there are still many varieties which will endure the chill of early frosts, and we agree with Mr. O'Mara that there is no more suitable ornament for the outdoor garden than these sturdy varieties, whose flowers of yellow and white and pink and bronze harmonize so perfectly with the autumn colors about them.

Notes.

Good plants of the Rose Madame Georges Bruant are now bearing their pure white flowers with considerable freedom, and, indeed, there has hardly been a day throughout the summer when this plant did not show some flowers. Few people who are acquainted with it will dissent from the opinion expressed in *Meehan's Monthly* that this hybrid of Rosa rugosa is one of the best horticultural acquisitions of recent years.

Mr. Merritt Fernald, of the Gray Herbarium, prints, in the *Proceedings of the Boston Society of Natural History*, a supplement to the catalogue of the plants in that state published in 1892. Sixteen hundred and fifty-six species and varieties of flowering plants and ferns, native and naturalized, are now credited to the flora of Maine. In the last edition of the Maine catalogue 1,578 species were included; from these Mr. Fernald now drops seventy-seven species and adds 155 species not credited before to the state.

Last week the Rhode Island Horticultural Society celebrated its fiftieth anniversary with fitting exercises, both social and literary. Mr. Amasa M. Eaton read an historical paper of permanent value, giving, in addition to sound counsel as to the legitimate purpose of such a society, a brief sketch of the work which it had already accomplished in various fields, with some account of the many public-spirited men and women who have helped to make it useful. Governor Lippitt, Professor Henry L. Parker, of the Worcester County Horticultural Association, Miss Sarah Doyle, Hon. John N. Washburne, of the Kingston College, and others made suitable addresses.

Dr. Ephraim W. Bull, the originator of the Concord Grape, died at Concord, Massachusetts, on the 27th of September, in his ninetieth year. Dr. Bull studied and practiced medicine in the city of Boston until failing health compelled him to remove to Concord, where he lived the remainder of his life. He will long be remembered as the introducer of the Concord Grape, which he exhibited for the first time in 1853 at the twenty-fifth annual exhibition of the Massachusetts Horticultural Society, and which has become the most popular grape in America. While not a Grape of the finest quality, its hardness, vigor, productiveness, appearance and adaptability to various soils and situations have caused it to be planted so generally that more Concord grapes are grown and marketed than all other sorts combined. The Cottage, Esther, Rockwood and Una are other varieties of merit for which the grape-growers of the country are indebted to Dr. Bull.

An exhibition of Cannas was made by the New York Florists' Club on Monday evening of last week, and it proved very interesting in spite of the hot weather under which the flowers refused to stand up any length of time. All the standard varieties were displayed in excellent form. Among the newer kinds of superior quality which we observed was Mrs. Fairman Rogers, exhibited by Mr. James F. Cowles, of Newport, which had a singularly compact truss of bright scarlet flowers with yellow-edged petals. Eldorado and F. R. Pierson were the best of those exhibited by F. R. Pierson & Co., and there was an unnamed seedling with exceedingly dark-colored leaves. Among the seedlings shown by James Dean, of Bay Ridge, the bright yellow Orienta attracted the most attention, although Defender and Embla were strikingly good. Peter Henderson & Co. also made a fine display, as did Siebrecht & Wadley, and John White, of Elizabeth, New Jersey, whose seedling Golden Queen, with richly variegated leaves, is distinct and beautiful.

The latest plums of the season, now nearly ended, are Ickworth Imperatrice, a purple fruit with irregular streaks of fawn color, one of the best for shipping and keeping qualities,

the greenish yellow flesh being sweet and rich in flavor; Silver prune, large, almost translucent, and valued highly for drying; the large German prune, its purple skin covered with abundant blue bloom, and Coe's Late Red, which is seen here as late as February. Bilyeus Late October peaches, large white-flesh free-stones, are now coming from California, with Salways and Honey Clings. With the season for Bartletts ended, Doyenne du Comice, Forelle, Winter Nelis and P. Barry now make up the California shipments of pears. The Forelle, known also as the German Trout pear, is especially beautiful, full-grown specimens being long, bell-shaped, the color a clear bright-yellow, with brilliant red cheek. Choice Majori lemons have recently realized the extreme price of \$12.50 a box, so that the retailers' price of \$1.00 a dozen is not excessive. Grape-fruit, in considerable quantities and of good quality, is coming from Jamaica, and retails at ten cents each.

Monsieur Lemoine, of Nancy, sends us photographs of a new *Deutzia* raised by him by crossing *D. gracilis* and *D. parviflora*, and described as *D. Lemoinei* in the Bulletin of the National Society of France, which awarded to it in August last year, when it was first exhibited in Paris, a certificate of merit of the first class. In 1891 Monsieur Lemoine fertilized the flowers of *D. parviflora* with the pollen of *D. gracilis* and obtained from this cross a number of individuals which have proved perfectly hardy during the last three winters. They form dense bushes now more than two and a half feet high, with erect branches which cover themselves with flowers early in May. *D. Lemoinei* is described as intermediate between the two parents; the branches are more erect and solid than those of *D. gracilis*, the pollen parent, and are more regular, shorter, and more numerous than those of *D. parviflora*, the seed parent. The flowers, which are produced more regularly than on *D. parviflora*, are borne in hemispherical or cone-shaped panicles, composed of from fifteen to twenty-five flowers nearly an inch in diameter when expanded. The petals are large, oval, with undulate margins, and pure white. It is suggested that *D. Lemoinei* will be an excellent subject for forcing. It is probable that this interesting plant has not yet been tried in this country. The photographs with which Monsieur Lemoine has favored us show plants covered with flowers and of good habit.

About five years ago Professor H. L. Bolley demonstrated that Potato scab was caused by a minute vegetable parasite, and although Dr. Thaxter a short time later announced the discovery of another organism, *Oospora scabies*, which was capable of producing scab and which is considered the chief cause of the trouble, the practical conclusions drawn from Professor Bolley's studies were valid, and they were noteworthy as an example of a proposed remedy based strictly on the scientific investigation of the cause of the disease. This disease attacks the crop through infected tubers, and Professor Bolley showed that if these are immersed in a corrosive sublimate solution of the strength of one in a thousand, that is, two ounces to fifteen gallons of water, the crop will be essentially free from surface blemishes and have a greater market value. Dr. J. C. Arthur, botanist of the Purdue Experiment Station, has lately issued an interesting bulletin on this subject, giving the result of three years' trials of the corrosive sublimate treatment, and these trials, taken separately or collectively, establish the efficient character of the remedy. The treatment is easy and cheap. The poison should be dissolved in a small amount of hot water in an earthenware dish and the solution added to the water in a wooden cask. The bath should be about an hour and a half long, although some variation in the time is immaterial. A glass or earthenware vessel may be used for disinfecting a few tubers, but vessels of iron, tin or copper should never be used. The solution may be poured off and used over and over again as dirt does not injure it. Of course, great care must be exercised with so deadly a poison. It ought to be added, perhaps, that Dr. Arthur makes no mention of the researches of Professor Hopkins, which seem to have shown that certain fungus gnats are able to inflict injuries upon potatoes which resemble the scab, and that he considers it probable that much of the loss from imperfect potatoes is due to them. Without making a study of the causes of this disease, Professor Halsted has also been experimenting on the New Jersey Agricultural College farm with sulphur as a remedy, using upon one plot the flowers of sulphur at the rate of three hundred pounds per acre. The freshly cut tubers used for seed were rolled in sulphur, and the rest of it was sprinkled in the open row at planting time. In this plot the potatoes came out practically free from disease, while in the adjoining plots, treated in exactly the same way, except that the sulphur was omitted, all or nearly all of the potatoes were scabbed.

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLE:—Agricultural Experiment Stations.....	401
Observations in California Forests.....	<i>Charles Howard Shinn</i> 402
FOREIGN CORRESPONDENCE:—London Letter.....	<i>W. Watson</i> 403
NEW OR LITTLE-KNOWN PLANTS:— <i>Rhus Michauxii</i> (With figure).	<i>C. S. S.</i> 404
PLANT NOTES:—The Viburnums.....	404
CULTURAL DEPARTMENT:—Late-blooming Hardy Herbaceous Plants.—II.	
Notes from the Washington Botanic Gardens	<i>J. Woodward Manning</i> 406
Cannas	<i>William Scott</i> 407
Forcing-house Notes	<i>G. Harold Powell</i> 407
Marantas	<i>William Scott</i> 407
Ipomoea imperialis	<i>J. N. Gerard</i> 408
The Golden Pocklington Grape	<i>E. P. Powell</i> 408
CORRESPONDENCE:—The Palm-houses at Washington.....	<i>G. W. O.</i> 408
Lake Keuka Vineyards.....	<i>L. F. Vance</i> 408
September Wild Flowers.....	<i>Dorcus E. Collins</i> 409
RECENT PUBLICATIONS	409
NOTES	410
ILLUSTRATION:— <i>Rhus Michauxii</i> , Fig. 55.....	405

Agricultural Experiment Stations.

THE first of the Farmers' Bulletins issued from the Office of Experiment Stations after it had been established at Washington was entitled, "The What and Why of Agricultural Experiment Stations." This publication has been out of print for some time, and Bulletin No. 26, which has just been issued, is intended to supply its place and give a brief summary of the objects of the stations in the United States and their work as it is now conducted. Of course, in a pamphlet of sixteen pages it is difficult to present with any clearness anything more than the leading features of the system, but the work has been well done, and any careful reader of this bulletin can not only interpret correctly the general purposes for which the stations were established, but he can appreciate to some extent the magnitude of the enterprise and its prospective value.

These stations cost annually a million dollars, three-fourths of which amount comes from the national treasury, and yet this large sum involves the use of but thirty cents for every thousand dollars' worth of the agricultural production of the country. More than 550 persons are engaged in this work, and last year a total of 4,500,000 copies of more than 450 different publications were distributed. There is some disposition, especially in the daily papers of our large cities, to criticise the work done at these experiment stations, but when it is remembered that the first one in the world was established less than fifty years ago; that the first one in this country was established only twenty years ago, and that stations are now in operation in every one of our states and territories, it is remarkable that so many of them are effectively manned and that they have already settled down upon lines of work which promise to be most broadly useful. They serve as bureaus of information to which farmers can turn for advice on matters of practical interest in their calling. They have helped to introduce improved processes, new crops, new varieties of live stock and new agricultural industries. They have been of great assistance in improving the quality and guaranteeing the purity of fertilizers and foods, and they are beginning to do the same work for seeds. They have given important help to the farmer against the attacks of insects and diseases which injure his crops and

his animals. Best of all, they have held to the primary purpose of making tests and experiments from which to deduce scientific principles to be used as the basis of agricultural practice.

It is in the strict line of scientific research that these stations will ultimately do their best work, but it is just here where it seems obscure and absurd to so-called practical men. The experiment station is not a model farm or a money-making farm, but a field of investigation. The ordinary field-work here is not to raise crops, but to ascertain principles, and the successful farmer who sees in this work wide departures from what he considers the best practice too often concludes that the man of science is a dreamer, without any vital connection with the every-day busy world. But the fact is that the apparent failures in the field-work are quite as important as the apparent successes in furnishing data for comparison and study. These labors in the experiment stations are well compared in this bulletin to those of the chemist or the microscopist, or the electrician, whom many large manufacturing establishments find it profitable to keep constantly employed. These men of science ruin much valuable material, they work for months without any apparent result or without bringing a dollar into the treasury of the manufacturer, but they are learning principles, and some day these will lead to the discovery of some process which will give their employer the advantage over his competitors and much more than pay for all their labor has cost. Of course, there is always the risk of failure, but experience has shown that it pays in the arts to employ talents of scientific men. In these stations the Government undertakes to do for the farmer just what the manufacturers are doing for themselves. This work must be judged, just as other expert work is judged, by its final result after years of experience.

But while the work in the stations cannot be too rigidly scientific, it is to be noted that according to the law the bulletins are to be printed for the farmers. It is worth saying, that sometimes these bulletins contain scientific discussions, local floras and other matters which more properly belong to the journals of learned societies. It is bewildering and discouraging for a farmer to receive a bulletin which is beyond his comprehension, or treats of subjects only remotely related to his calling, and, therefore, it should be the aim of the stations to publish for circulation among farmers and fruit-growers only such matter as has direct agricultural and horticultural value.

We have also observed that experimenters sometimes publish their field-notes instead of results and generalizations from their work. Of course, when horticulturists make tests of varieties and do similar work, it is necessary that they should take accurate notes from day to day. But these notes are for their own study and not for the public. The farmer or gardener wants general conclusions plainly set forth, and not tables which must be studied long before they mean anything. Now and then an experimenter imagines that columns of figures and statistics are satisfactory scientific work. Of course, the experimenter needs such figures for his own study, but what is of real value in his work is expressed in his final judgment, based on all the data he has collected. It is usually a mistake to publish these figures in detail. They are for the experimenter alone, and after all they are usually but a part of what he has gleaned from a long and intimate acquaintance with his subject, and he must be familiar with all its phases to give the highest value to his final generalizations.

It is not our present purpose, however, to criticise the conduct of the stations, but rather to invite attention to this bulletin, and to suggest to all persons who feel the need of special information on any points in horticultural or agricultural practice to apply to the station in their respective states. It is the privilege of the people to present their own experience and ask for direct, personal aid; and such interchange establishes a living connection between the farms and gardens of the country and the institutions

which have been founded for their benefit. Knowledge—technical knowledge—is needed more and more as the struggle for existence becomes more complex and more strenuous. The fruit-grower, the market-gardener, the dairyman, the general farmer, who secures any return for his labor beyond the mere necessities of life, achieves this only by an intelligent adaptation of the teachings of science and experience to his special case. He must study for himself, and he needs all the help he can get from experts whose lives are devoted to the solution of the problems of agriculture in its broadest meaning.

Observations in California Forests.

THREE is so much to see in any forest tract that it takes a long time for an observer to reach the point when the minute daily life of the region becomes familiar. I had never given any thought to this matter until it happened that we camped for the second time in the interesting part of the Sierras along the south Yuba, by the famous old Dutch Flat stage road near the snow-sheds in the Cisco region. The place has a neglected aspect, because large portions of the district are overpastured and nearly all the valuable timber has been cut off. In fact, no one can understand the country without some knowledge of its history. When the stage road was built across, in the early sixties, it became one of the great routes of travel to Nevada. Thousands of vehicles passed over it every year, and towns of considerable size grew up only a few miles apart. The road was kept sprinkled from end to end, and was, in brief, one of those great, but now forgotten, arteries of the picturesque commerce of the mining period. A great mountain river foams down the bottom of a vast gorge in the everlasting granite. The portion of the gorge to which these notes relate is at an elevation of about six thousand feet. The sides of the gorge are fully fifteen hundred feet higher, and from crest to crest across our camp, as the eagle flies, the distance is not less than three miles. The general aspect of the country from any elevation is that of great and lonely desolation. Over naked granite cliffs rise the snow peaks under the blue Sierra skies. But there was a time when the whole gorge, excepting the more abrupt granite points, was clothed in forests of *Pinus ponderosa*, *Abies concolor* and other superb conifers. The enormous demands made for the towns along the stage road, for the construction of the railroad and for the snow-sheds, and the frequent forest fires have laid the district waste. Once there were saw-mills, cattle-yards, large hotels and stage stations where our camp of this year stood, and more than three thousand people, it is said, lived along a mile of the rushing mountain river.

The first impression one obtains of this wilderness is that its usefulness has perished; that there cannot be any more forest here; that the wasting soil is drifting slowly from the rocks into the bottom of the gorge; that even lesser forms of vegetation will little by little disappear, and the scant pasture become even scantier. In this spirit, therefore, shocked with the evidence of waste and slaughter, and profoundly discouraged, I began to consider whether the reproductive powers of the forest were still sufficient, under proper conditions, to restore it to its former usefulness. The results of my observations were in some respects surprising, although based upon simple facts which should be known to every woodsman.

The forest problems in this district, which is one of the highways along which cattle and sheep are driven into the fastnesses of the Sierras and back to the valleys, are assuredly as difficult and numerous as those of any other part of California. If the leading species will reproduce themselves here, or if some species are gaining foothold, or if a little care and attention would enable the young trees to overcome all obstacles, it seems certain that immense areas in the Sierras elsewhere also could be reforested. The enemies of the forest here are first the sheep, second the cattle, third the old trees which die, and, felled

by the winter storms, break down hundreds of the younger trees; lastly, the fires.

In order to gain some idea of the powers of reproduction possessed by the leading conifers, I climbed a mass of almost naked granite, covering, perhaps, twenty acres of ground. Its seemingly barren summit was three hundred yards in a direct line from any specimen of *Pinus ponderosa*, and far above it. Nevertheless, in minute crevices and pitted hollows the size of a thimble, where a few grains of sand had drifted, there were young trees of *P. ponderosa*—last winter's seedlings. In one crevice eighteen inches long, and too narrow for my knife-blade to enter, nine such tiny Pines were growing. The seeds must have caught in small inequalities of the surface and thrust their roots downward in a crack made by the frost. The seedling of this barren spot must have come from cones hurricane-driven, or from some stunted tree since torn from the rocks. All around this granite crest, in every hollow, Pine-trees were beginning to root. Here and there some had perished, but they were slowly taking possession. As the soil became better, and where there was a barrowful of sand instead of a handful, *Abies concolor* and *Libocedrus decurrens* mingled with the Pines. While no one would expect to see a forest of merchantable timber produced upon these granite walls, the enormous reproductive ability of the Pines needs no further illustration.

The valleys along the river contain deep and rich beds of soil and leaf-mold in perfect condition for carrying immense timber growth. Upon one-half acre of such soil I counted thirty-three stumps of *Pinus Lambertiana*, *P. ponderosa* and *Abies concolor*. The largest stump was about eight feet in diameter. Even here small trees are continually reproduced every spring, to be trampled down every summer, for a few stunted trees in the rocks still scatter their seeds over the desolated nook. I am convinced that over this entire district, from the lowest point in the gorge to the highest pinnacle of rocks, Nature still plants enough seedlings yearly to produce as many seedling trees as the district will carry, but only one tree in a thousand ever arrives at maturity.

Over all this region there are very beautiful groves of second-growth timber, from twenty to forty years old. The trouble with most of these is that they are often broken down in windrows by the fall of dead trees, or by masses of snow. Sometimes one sees little groves of several acres, in the rich flats, which are almost perfect, but the need of the axe is in most cases very great. A tree which has grown upright for five or six feet, if then broken down, the leader turning at right angles or bending to the ground, can never again make a shapely top. Some of these second-growth groves make one's heart ache, they are so forlorn. One wishes to take an axe and spend a week there from dawn to dark, cutting out the distorted trees so as to give the rest a chance. There are more than enough straight trees on each acre of such land to make a prosperous forest. The way these windrows fall is difficult to describe without the aid of a photograph. In one case which I studied, a dry Fir-tree, perhaps a hundred feet high and two feet in diameter at the base—a tree which could easily have been removed by a forester, without doing any injury to the young groves—had slowly sagged downward, year after year, until last winter it came over upon the young trees, breaking down a number of the largest which were from twenty to fifty feet high; these, of course, brought down still others, bending them so that in all about seventy-five trees of over five feet in height were practically destroyed by the weight of the bending trees and of the snow, which in this district usually lies fifteen feet deep on the level.

Agricultural value, except for temporary pasture, this region does not possess. It can never be settled with farmers, nor with miners, for it is far above the farming belt and the mineral belt of California. It will never again be on a route of travel, unless civilization goes back to the stage coach. If it could be reforested, the fish and game supply

would be even better than it is now, and it would soon support a considerable population and be of direct advantage to the state. It is a spot which is typical of the dullest condition of the high Sierras, and here, or in some similar place, the National Government could well afford to set apart a square mile of land for a forestry station, in order to prepare for the forests of the future. The suggestion of such a forestry experiment in the Sierras and a similar one in the Coast Range, upon land that is definitely unagricultural, has been made before now, and it should be kept before our law-makers; Congress after Congress, until definite results are reached.

Niles, Calif.

Charles Howard Shinn.

Foreign Correspondence.

London Letter.

GERBERA JAMESONI.—This pretty Composite perennial was introduced from south Africa seven years ago, and for several years it was grown in pots in a greenhouse. It has, however, since proved to be quite hardy in a south border, and in some gardens, notably the botanic garden at Cambridge, it makes a beautiful display of flowers all through the summer. The number of flowers open at once upon a single plant has been as many as fifteen, and as each flower is over four inches across and colored bright vermillion the effect is exceptionally good. The plant has a tuberous root-stock, stalked pinnatifid leaves about a foot long, and erect scapes from fifteen to thirty inches long, nodding at the apex, and bearing a single flower-head composed of a disk and a radiating single row of narrow petals. They last a long time. At Cambridge the leaves are said to be two feet high and the scapes three feet. I do not suppose that the plant would stand severe frost, but it might be grown where the Belladonna Lily would live.

POLYGONUM COMPACTUM.—There are two large beds of this plant in a conspicuous place on the lawns at Kew, and for the past month or more they have been very attractive. The plant grows to a height of about eighteen inches, produces many shoots, clothed with cordate leaves four inches long, bright green, with red petioles. The flowers, which are crowded on erect terminal and axillary panicles, are whitish, tinged with rose, and in the effect they produce they resemble somewhat the common *Spiraea* (*Astilbe*) *Japonica*. Although long grown at Kew, this really handsome *Polygonum* has never had an opportunity till this year of proving its worth as a garden-plant. It is a perennial, and is as easily propagated from cuttings, division of the root-stock or seeds as *Polygonums* generally are. It is a native of Japan and is quite hardy here.

POLYGONUM LANIGERUM.—This is a large and handsome-leaved annual species of recent introduction (I believe it was first cultivated at St. Petersburg in 1890), and is a most suitable plant for a position in the herbaceous garden or to fill a bed on a lawn. It has stout semi-procumbent stems, a single plant forming in a few weeks a mass six feet through and four feet high. The leaves are stalked, lanceolate, about a foot long and four inches wide, elegantly curved into a half-circle and covered with a silvery tomentum, as in the Cape Silver-tree (*Leucodendron*). The plant at Kew has not yet flowered, but it promises to make a good display soon, and as the flowers are said to be red, and the succeeding nuts black, it ought to prove strikingly handsome when at its best. It is well worth attention for its foliage alone by any horticulturist who can appreciate a good lawn plant. It appears to be found wild in all parts of the world except Europe.

POLYGONUM ORIENTALE is one of the oldest of the exotic species that are sufficiently ornamental for the garden, but it is not often used with such effect as at Kew this year. Here it is a handsome feature of the herbaceous border, as well as in a pair of round beds on a lawn. In the latter position a rich soil has produced stems fully ten feet high and as thick as a man's wrist at the base; the leaves are

correspondingly large, but there are not so many flowers as upon the plants grown in poorer soil. These are six feet high and crowded with elegant, drooping tail-like racemes of coral-red flowers. The species is an annual and is of the easiest possible cultivation. It is just one of those handsome, good-natured plants which fit many a corner in the outdoor garden, but are often overlooked. *P. orientale* is an eastern plant, ranging from the Himalaya to China and Japan. There is a white-flowered variety of it.

IMPATIENS AMPHORATA.—This is a rival to the old *Impatiens Roylei*, which is naturalized in England and which is at the same time one of the most commonly grown plants in cottagers' gardens. *I. amphorata* was introduced to Kew last year from the Himalayas. It ripened plenty of seeds, which were sown in beds and in the wild garden, and from these there are now handsome bush-like specimens four feet through, with slender upright stems, ovate leaves two or three inches long and a great number of flowers about half as large as those of *I. Roylei*, and colored soft-rose, with the upper segment white and a blotch of yellow in the throat. It is a good plant for the herbaceous border, as it flowers freely and continuously all through the summer. If *I. Roylei* is not common in the United States it is worth being made so.

PHYSALIS FRANCHETI.—This beautiful border plant is charming in every character, the stems healthy, the foliage vigorous and of a rich green, and the Chinese lantern-like fruits nearly three inches in diameter and of the brightest orange-red color. It is a plant for the million, as it is perennial and as hardy, apparently, as the old *Physalis Alkekengi*. It will be remembered that *P. Franchetii* was introduced last year by Messrs. Veitch & Sons, Chelsea, and that it was named by Dr. Masters in compliment to Professor Franchet, the well-known French botanist, to whom we are indebted for recognizing this as a distinct and promising garden-plant. It is worth growing for the sake of its fruit in the autumn, which, if cut with the stems, would be popular for floral decorations.

ALTHAEA FICIFOLIA.—I believe I mentioned this plant about a year ago as a good subject for the herbaceous border. It is exceptionally fine again at Kew, forming a large cluster of stems six feet high, clothed to the base with rugose fig-shaped leaves a foot in diameter, and bearing axillary flowers four inches across of a clear primrose-yellow color. It is a near ally of the Hollyhock, *A. rosea*, but differs from that in its looser habit of growth and in the digitately lobed character of its leaves. It is perennial, I believe, but it ripens seeds freely, from which flowering plants can be raised in one year. It might be a good plant to cross with the garden Hollyhock, with a view to strengthening the latter against the devastating disease, *Puccinia malvacearum*, which has driven the Hollyhock out of cultivation in many districts.

HELIANTHUS RIGIDUS, var. **MISS MELLISH.**—The Sunflowers are beautiful with us in September and October, and one of the best of them is that here named, which was first brought into notice here about three years ago. It differs from the type in having larger flowers of a purer golden yellow color, while in height, five feet, it is exactly right for beds. A large circular bed, twenty feet across, filled entirely with this plant and situated on the sunny side of a tall black green yew hedge, is a magnificent picture here now. The plant is easily multiplied by division of the root-stock or from cuttings. It is already very popular in the garden here. A few groups of such plants as this, the big Ox-eye, Chrysanthemum, purple Aster and Kniphofias, if planted with taste in the pinetum, have a wonderfully brightening effect upon that otherwise usually sombre part of the garden.

BEDDING BEGONIAS.—The craze for the big-flowered tuberous Begonia has crowded out of notice some of the pretty little sorts which used to find favor. There is, for instance, no Begonia more deserving of a place among summer bedding plants than the old *B. Worthiana*, a sport from *B. Boliviensis*. It has been beautiful all through the summer

at Kew, the stems, less than a foot in height, being crowded with elegant narrow leaves and bright red drooping flowers. The *semperflorens* race is also valuable for summer bedding. They keep dwarf and flower freely when grown out-of-doors in full sunshine, and as there are now many varieties they are sufficient in themselves to furnish a "design." The best of those used at Kew are: *rosea*, with pale blush-pink flowers; *Crimson Gem*, with crimson-purple tipped leaves and deep blood-red flowers; and the type which has glossy green leaves and bright red flowers. They are raised from spring-struck cuttings.

London.

W. Watson.

New or Little-known Plants.

Rhus Michauxii.

THIS extremely rare, little-known and long lost shrub, was discovered at the end of the last century by the French botanist Michaux, in western North Carolina, in what is now Mecklenburg County. Later it was found by Lyon in North Carolina in fruit, and in flower by Boikin, and by Le Conte in Georgia; and recently it has been rediscovered by Mr. W. W. Ashe, of the Geological Survey of North Carolina, at Farmington, Davie County, in western North Carolina; and by Mr. F. B. Boynton and Mr. F. L. Olmsted, Jr., it was introduced last summer into Mr. Vanderbilt's Arboretum at Biltmore, whence it has been sent to the Arnold Arboretum. By Messrs. Boynton and Olmsted, who found three clumps of this plant, with ripe fruit, *Rhus Michauxii* (see illustration on page 405 of this issue) is described as a shrub with erect stems from one to three feet in height, spreading extensively by underground stolons. The stems are stout, and, like the petioles, the lower surface of the leaflets and the panicles of flowers and fruit are villose-pubescent. The leaves are deciduous, from twelve to fourteen inches in length, with about eleven leaflets; these are oval or oblong, acute, gradually narrowed or rounded and slightly cordate at the base, coarsely crenately serrate, dark dull green on the upper surface, which is pilose along the conspicuous veins, pale on the lower surface, about two and a half inches long, an inch and a half wide, and sessile or very short-stalked, with the exception of the terminal leaflet, which is borne on a winged petiolule three-quarters of an inch in length. The panicles of flowers, which were collected by both Boikin and Le Conte, are terminal, thyrsoid, nearly sessile, about six inches long and nearly three inches broad. The calyx is covered with cinereous tomentum and is divided into oblong-triangular lobes, rather shorter than the oblong rounded pale yellow petals. The fruit is nearly globose, about an eighth of an inch in diameter, bright scarlet, and clothed with close silky pubescence.

The juices of *Rhus Michauxii* turn black in drying, like those of several of the poisonous species of *Rhus*, and Pursh, on the testimony of Lyon, who suffered seriously from it, and Torrey and Gray describe the plant as exceedingly poisonous, while Curtis denies its poisonous properties. From my limited experience with a partly dried specimen I am inclined to believe that it is the most poisonous of the North American species.

Five years before the publication of *Rhus pumila* in Michaux's *Flora* the name was used by Meeburgh in 1798 (*Pl. Select. Icon. Pict.*, t. 14) for another plant, which is probably not a *Rhus* at all, so that the name is not available for Michaux's plant, for which I propose the name of its discoverer.

C. S. S.

Plant Notes.

The Viburnums.

TWO weeks ago we spoke of the value of the Cranberry, *Viburnum Opulus*, as an ornamental plant. But it is not more beautiful or valuable than many other species of this genus, which is represented in North America by several of the handsomest shrubs of our forest glades.

Viburnum Lentago and *Viburnum prunifolium*, which often grow to the size of small trees, are beautiful with their lustrous leaves, their broad flat clusters of flowers and brilliant fruit; this in ripening changes from green to pink and then to a deep blue, berries of these three colors being often seen together in the same cluster. These are both hardy, fast-growing, vigorous and attractive plants, equally well suited to decorate a lawn or the margin of a wood.

Viburnum cassinooides and *Viburnum nudum*, the first from northern and the second from southern swamps, are as beautiful in cultivation as any shrubs we are acquainted with. They both have thick opaque lustrous leaves, large clusters of pale yellow flowers and fruit, which in ripening turns bright pink and then deep blue. *Viburnum dentatum* and *Viburnum Molle* are vigorous plants with large, coarsely serrate, lustrous, membranaceous leaves and small bright blue fruit, which does not turn pink in ripening.

Viburnum acerifolium is a comparatively dwarf shrub with slender branches, three-lobed and three-ribbed leaves, in form not unlike those of some varieties of the Scarlet Maple, small clusters of flowers and dark blue or nearly black fruit. From the decorative point of view, its greatest value is found in its neat habit and the purple and dark red colors of its autumn foliage. *Viburnum pumilus* is a smaller and rarer plant than any of those we have already mentioned. It is distinguished for its excellent habit and the peculiar deep purple color its leaves assume late in the autumn. This autumn coloring of the leaves is the chief attraction of this *Viburnum*, but this is so great that it should find a place in every collection.

The most beautiful, perhaps, of all our *Viburnums*, the Hobble-bush, *Viburnum lantanoides*, is the only species that it is difficult to accustom to the conditions and surroundings of the garden. Like *Viburnum Opulus*, it produces large marginal, sterile white flowers surrounding the clusters of small fertile blossoms, but these sterile flowers are larger than those of the Cranberry-bush, and the whole inflorescence is larger and more beautiful. The large rounded leaves of the Hobble-bush are very handsome, and those of no other plant assume a more brilliant scarlet color in autumn. The fruit in ripening is bright red, but finally turns dark blue-black.

These are all species of eastern America, common inhabitants of the forest and the borders of swamps, fields and highways; but in the old world are several *Viburnums* that are hardly less beautiful than our American species. The Wayfaring-tree, *Viburnum Lantana*, of Europe, is one of the best foreign shrubs that have been transplanted into our shrubberies. The foliage is bold, vigorous and deep-colored. The flowers are produced in profusion, and the fruit, which is black and lustrous when fully ripe, at one time in the summer is bright red. Japan has already contributed to our gardens *Viburnum tomentosum*, *Viburnum Sieboldii* and *Viburnum dilatatum*—all decorative plants of the first class; but in Japan are several other *Viburnums* which will probably prove as desirable ornaments to our gardens as any of these. Among them are *Viburnum furcatum*, the Japanese representative of our Hobble-bush, although a larger and more beautiful plant, common in the forests of Hokkaido, and the scarlet-fruited *Viburnum Wrightii*, a shrub which reminds Americans that their compatriot, Charles Wright, collected plants on the shores of Volcano Bay as well as on the deserts of our south-western boundary.

Several other Asiatic species now known to science, but not yet introduced into our gardens, may be expected to add variety and charm to northern shrubberies, but considering only the common and well-known species, and taking them altogether, the *Viburnums* form, perhaps, the most satisfactory group of the deciduous-leaved shrubs of our northern gardens. They are perfectly hardy; they are easily raised from seed and easily transplanted; they are exceptionally free from disease and the attacks of insects; they grow rapidly into shapely bushes, producing their flowers and fruit profusely, and in autumn the foliage of

several species assumes brilliant colors, and in planting a garden or park in the northern states, if our choice of material was confined to the species of a single genus, we should not hesitate to select the Viburnums.

LONICERA ORIENTALIS.—A correspondent writing to this journal several years ago (vol. ii., page 296) spoke of the small value of this shrub in comparison with several of the other bush Honeysuckles, especially the fine forms of *Lonicera Tartarica* and some western Asiatic species. To the

branched, round-topped, leafy bush of a good habit, and, therefore, well suited to stand by itself on the lawn or in the shrubbery. A good plant to associate with the Oriental Honeysuckle is the yellow-flowered *Lonicera chrysanthia* of Amurland, northern China and Japan. This is a tall, stout, wide-spreading shrub with ample ovate-acuminate, conspicuously veined leaves, small pale yellow flowers raised on long slender peduncles, and light cherry-red lustrous fruit which ripens with that of *L. orientalis* and retains its beauty for several weeks. Cultivated for many years in the Arnold



Fig. 55.—*Rhus Michauxii*.—See page 404.

beauty of this plant, however, about the first of September, when it is covered with its large black lustrous fruit, our correspondent hardly did justice, for at that period of the year it is certainly one of the most attractive shrubs of its class, holding in beauty its fruit, which ripens late and is black in color, for a long time after the berries of the Tatarian and Ruprecht's Honeysuckles have fallen to the ground or lost their brilliancy. *L. orientalis*, which is a native of the Orient from Asia Minor to Cashmere and the temperate Himalayas, becomes in this country a low-

Arboretum at Boston, *L. chrysanthia* has shown itself perfectly hardy there and in every way a desirable and useful shrub. The plants, like those of all the bush Honeysuckles, show considerable variation, and among several varieties cultivated in the Arboretum is one obtained from seeds gathered by Dr. Bretschneider on the mountains near Pekin. The fruit of this plant is nearly translucent, and is considered by many persons more beautiful than the fruit of *Lonicera Ruprechtiana* or of any of the other bush Honeysuckles in the collection.

SAINTPAULIA IONANTHA. — This beautiful Gesneriad, a dwarf Gloxinia-like plant, deserves special mention among the new flowering plants. Its neat, compact habit and its time of flowering make it a valuable acquisition, indeed. The flowers are produced in cymes from the axils of the leaves on slender peduncles, four or more together. The color is a lovely lavender or pale blue, the anthers being golden-yellow. The corolla about three-fourths of an inch in diameter, irregularly five-cleft, almost flat, with a very short tube. The leaves are cordate, fleshy and hairy, on long, brittle petioles, deep green, and a very dark olive-green when mature. The plant is stemless and spreading, seldom more than six or eight inches high, and is very floriferous throughout the winter months. It will, perhaps, prove useful and interesting for hybridizing purposes, and will, undoubtedly, be improved upon by cultivation. April is a suitable month for sowing the seed, and as the plant grows rapidly, large-flowering specimens can be had in September or October. The seeds, which are very fine, should not be covered, but merely sown on the surface of the soil in a well-watered pot. They germinate in two weeks. The seedlings should be pricked off in a soil composed of equal parts loam, leaf-mold and sand as soon as possible. They will be ready for planting singly in two-inch pots about two months from sowing, after which they grow rapidly and must be repotted twice during the summer—first into three-inch, then into five-inch pots, which is a suitable size for flowering plants. A temperature of seventy-five degrees during the summer, and about seventy during the flowering season, is sufficient. The foliage should be sprayed frequently, and the roots also require abundant moisture. It is quite probable that this interesting plant can be increased by means of leaf-cuttings in the same way as the Gloxinia, as broken leaves always form little plants wherever they happen to fall.

ACONITUM FISHERII. — This late-flowering Monkshood makes a very dwarf and compact plant, hardly a foot high, with large panicles of pale purplish-blue flowers. It remains in bloom for a considerable time, from September until late in the fall, and will grow in very dry and sunny positions. During the present dry season it is one of the few hardy herbaceous plants standing perfectly fresh and healthy, uninjured by sun and drought. The flowers are larger and of a paler color than those of the common Monkshood (*A. Napellus*), and the inflorescence is immense, considering the size of the plant. The ternate leaves are very thick and leathery and of a deep green color. The compact, floriferous habit of this plant makes it valuable for rockeries and select borders. All Monkshoods are, however, very poisonous, and the nearly related Delphiniums are far more desirable for small lawns and gardens.

PLEROMA SEMIDECANDRUM (*Lasiandra macrantha*). — This exceedingly beautiful plant of the Melastoma family is well suited for our American summers, as it will do well in the open air from May until October. The flowers measure four inches across and are produced in terminal cymes, one at a time. They are of a deep violet-blue color, and appear nearly all the year, more abundantly during the summer and early autumn months. The leaves are ovate, acuminate, dull green above, silvery beneath, on both sides covered with silky hairs. When grown in the full sunlight, if judiciously pruned, it will form a bushy plant or a slender-stemmed tree as beautiful for the conservatory as for the lawn. If planted out in a border in a greenhouse or conservatory and trained underneath the glass in the full sun it will form a strikingly beautiful object. It will do equally well in pots and flower more freely, although the flowers are never as large as they are on specimens planted out. When planted in the open border a partial rest is necessary to ripen the wood and to make sure of plenty of flowers. The best soil in this country for Lasiandras, as these plants are more generally called, is one composed of equal parts of rich fibrous loam and peat, with a liberal addition of sand. During the summer plenty of water should be given if the plants are grown in pots; in a bor-

der the plants can easily be overwatered. Cuttings of growing wood inserted singly in two-inch pots and placed in bottom-heat in a close frame root readily. The plants should be potted pretty firmly, and when established will do well under ordinary greenhouse treatment.

Cultural Department.

Late-blooming Hardy Herbaceous Plants.—II.

PHLOX NELSONII is giving its usual autumnal bloom of small stemless pure white flowers in sheets, which are shown off by its dark green moss-like foliage. *Physostegia Virginiana* is showy with its dense heads of pink flowers, and forms a good border plant some three feet high; it is of spreading habit, yet easily kept in bounds. Tall masses of *Pyrethrum uliginosum* are now at their best with their lavish supply of pure white Marguerite-like flowers, admirably adapted for cutting purposes. The double *Saponaria officinalis*, the old-fashioned Bouncing Bet of New England farm yards, though weedy and not to be recommended for the flower border, is a desirable plant for naturalizing, and shows dense heads of pale and deep purplish-pink double flowers. Some of the deeper pink forms are quite effective and should be used more often where a showy plant is desirable in a permanent position.

Senecio pulcher, though it requires heavy winter covering, abundantly repays this care and is in constant bloom from August until hard frost, producing rich purplish magenta, aster-like flowers, each an inch and a half to two inches across and borne in showy flat clusters.

The Pilot Weeds and Prairie Docks, such as *Silphium laciniatum*, *S. perfoliatum* and *S. terebinthianaceum*, are now giving a profusion of bloom, all with showy light yellow flowers and all unusually varied and interesting in their foliage and habit of growth. *Solidago rigida*, *S. sempervirens* and *S. Virgaurea* are among the best of the Golden-rods and form good border plants with bright golden yellow flowers. The first-named is the best, but unfortunately it is afflicted with a rust that must be contended with at its season of bloom. *Statice Gmelenii* still shows immense open heads of deep lilac blue flowers—a unique plant with peculiar strap-shaped foliage and a marvelous quantity of bloom.

Trollius Europeus, the Globe-flower, is once more in its element of temperature, and throws a constant succession of showy globular yellow flowers, as bright as they were in early spring. This is one of the finest plants to enliven the border in early summer and again in fall, and very choice for cutting. *Stobaea purpurea* now lifts up its broad candelabra-like head of rich deepest purple, spiny flowers, each three inches across. This is one of the most distinct of the Thistles, but its hardness has not yet been proved. *Anthemis tinctoria*, now that the seed-vessels from the first crop of flowers have been removed, is sending up a second lot of bloom, and, though rather weedy, is very effective with its Marguerite-like dark lemon-yellow flowers. *Ophiopogon Japonicus* is throwing up spikes of small deep blue flowers. *Sedum spectabile* displays its broad flat heads of rich pink flowers; *S. Sieboldii* shows small dense clusters of red flowers, while *S. maximum* is producing heads of creamy white and pink flowers.

Hibiscus moschuetos is out of flower, but its crimson-eyed variety is giving quite an effective show of large creamy white, red-throated flowers; *H. Californicus* is especially showy with its broad trumpet-shaped, waxy petaled, creamy white flowers with deep carmine centres, and these flowers are from five to seven inches across. Single plants that have been established are producing from 100 to 150 blooms each, giving a most effective show to the flower border. *Inula glandulosa* continues to give its showy, light yellow, finely cut rayed flowers in abundance. *Bupthalmum salicifolium* is again at work, producing its bright yellow flowers of good form, and well adapted for cutting, and the dark rich purplish blue flowers of the *Aconitum autumnale* are at their best.

Campanula Carpatica and its white variety are striving to excel each other in sustaining their blooming season until hard frost, and they still are among the best border plants. *C. Van Houttei* has given many spikes of second bloom, and has been especially welcomed. *Grindelia squarrosa* is in perfection, forming a bush three feet high and two feet through, with plenty of showy clear yellow flowers with good centres.

Veronica longifolia, var. *subsessilis*, is throwing out numerous side branches and promises an abundant display of rich bloom for some weeks to come. *Plumbago Larpentæ*, with its broad sheets of deep blue flowers, is at its best, and *Ery-*

gium alpinum is throwing up a second growth of its curiously formed and colored flower heads.

Echinacea purpurea is flowering as freely as it did six weeks ago, and *E. angustifolia* is giving a good quantity of showy, medium-sized flowers. Both of these are stately native plants. *Rudbeckia speciosa* still shows some bloom, while *R. subtomentosa* is at its best; immense branched heads of rich golden-yellow flowers, with purple, cone-like centres covering plants which grow to a height of three or four feet, are very effective. *Scabiosa Caucasica* is producing a great abundance of showy lavender-blue flowers with rich lavender centres which are eagerly sought for cutting.

The Sunflowers, from which at this time of the year we expect the richest effect, are not disappointing. *Helianthus decapetalus* is just passing by with its wealth of light lemon flowers. *H. multiflorus* has been for a full month giving a constant succession of large clear yellow flowers, four to five inches across, and borne on long stems well fitted for cutting. The double *H. multiflorus* has been in bloom since July and does not show any signs of abatement. *H. mollis* is one of the most desirable species, with its odd velvety foliage and handsomely formed light lemon-yellow flowers, each three inches or more in diameter. The tall *H. orgyalis* is just at its best, and *H. Davisii* shows immense heads of small golden-yellow flowers. *H. trachæfolius* and *H. gros-serratus* are two other coarse-growing forms, the first with yellow bloom and the second with orange-yellow and with a well-colored centre; and *H. latiflorus*, with its showy, cup-shaped, semidouble golden-yellow flowers, is not quite past its flowering season and continues to be in demand for cut work.

This article is already too long, but it by no means completes the list of hardy herbaceous plants which for weeks will continue to keep our borders bright. The long spikes of Lythrums and Liatris, and the broad heads of rich purple flowers on the Vernonias, the red and white Centranthus, with Campanula grandiflora preparing for its second bloom, Daphne cneorum giving its third crop of fragrant pink flowers, Birds'-foot Violets, Alpine and Iceland Poppies, and Heuchera sanguinea, flowering as they do in spring, hybrid Phloxes still in full show, Gaillardia grandiflora still opening its broad flowers with their bands of orange and maroon as bright as ever, Helenium autumnale, Funkia lancifolia, Armerias of various kinds with flowers of lavender, red and deep pink—all these and more help to make the flower garden in the waning year as interesting to the real lover of plants as it is in any other season.

Reading, Mass.

J. Woodward Manning.

Notes from the Washington Botanic Gardens.

Hunnemannia fumariæfolia.—If seeds of this beautiful Papaveraceous plant be sown now and wintered over in a cold frame, the plants will flower abundantly next season. This is one of the few plants common in our gardens which seem to revel in very hot weather. If set out in a sunny well-drained border it very soon attracts attention by its finely cut glaucous leaves and large Eschscholtzia-like flowers. It is a native of Mexico, presumably the coldest parts, as plants without protection have undergone zero weather without hurt; nevertheless, it is well worth taking a little extra care of in the way of winter protection. Its period of blooming is from midsummer till frost.

Caryopteris Mastacanthus.—The most attractive plant in the shrubbery at present in bloom is *Caryopteris Mastacanthus*. It is valuable for its period of blooming, when other things are, as a rule, looking rather seedy. The flowers are small, a goodly number of them springing from the axils of the leaves at the ends of the shoots. The color is violet-blue. At first sight the plant when in bloom is suggestive of a *Vitex*, to which genus it is closely allied. It is a native of China, so that in the northern states it will require protection during winter.

Solanum Wendlandii.—This plant has been tried out-of-doors here the past summer and it has flowered beautifully, but only during the last few weeks. It spent all the summer months in making long, stout growths. The plants were small when put out, but if larger ones had been tried I am inclined to think the flowering period would have been longer. In the northern states the proper place for it is in the greenhouse, trained up pillars or rafters, where it will make a display not easily surpassed in beauty. The flowers are very large for a *Solanum*, and bright lavender in color.

Vinca rosea.—The Madagascar Periwinkle has for several years been our handsomest bedding plant. From the day the plants are put out until cold weather they are never out of

bloom. To have them in bloom at planting-out time the seeds are sown early in the season, say by the end of January; by the middle of May they will be starting and in flower in three-inch pots. I think the kinds look best when kept separate from each other. As every one knows, one has pink flowers, another white ones, and a third white flowers with a pink eye. The plants reach a height of about eighteen inches in good seasons, and they are very symmetrical.

Botanic Garden, Washington, D. C.

G. W. O.

Cannas.

THE flowering season of these plants will soon be ended by frosts and the roots should be taken up at once. They should be allowed to dry a little and then be stored in boxes of dry sand, where the temperature will not fall below forty degrees. It is preferable to place them under the benches of the Carnation-house, or in a similar place rather than in a cellar, provided they are not exposed to the drying influence of hot-water pipes. The annual introduction of many new and improved varieties indicates the popularity of these plants, and this is partly due to their easy culture. The season of blooming can be lengthened if they are started indoors, but they will flower, although at a later date, if the tubers are planted in the open ground. If seeds are saved from the best varieties, and a batch of seedlings raised every year, a fair percentage of the plants will be found worthy of preservation, while there is always a chance of getting something good.

Cannas are easily hybridized, and insects usually work busily on them, so that if artificial impregnation is used for a direct cross between two varieties it is necessary to have some means of protecting them from insects.

To obtain strong plants from seed by planting-out time the seeds should be sown in January. Plenty of bottom-heat is necessary, as they are hard to germinate. If good bottom-heat is not obtainable, germination is greatly assisted by soaking the seeds in tepid water. They should be inserted singly in small pots filled with an open sandy compost. The plants should not be allowed to become pot-bound, for the roots are brittle and easily broken in shifting. To avoid any check when planting out, the plants ought to be well hardened off.

Tarrytown, N. Y.

William Scott.

Forcing-house Notes.

THE first fires of the season were started in the forcing-houses here on September 29th. Although there was no danger of frost on that day, the houses were cold and damp. Plants for winter vegetables should never be chilled at this time of year, as a chill weakens their constitution, stunts their growth and renders them liable to diseases of all kinds. Plants for winter crops should be kept growing steadily now, and every unfavorable condition removed. Cucumbers and Melons were put in the beds last week, and the Tomatoes and Radishes are about to go in.

A study of the soils adapted to forcing different vegetables is of the first importance. It is not uncommon to see the same mixture used for several plants whose habit of growth and feeding are dissimilar. It is believed that the physical properties of the soil—that is, its proportion of gravel, sand, clay, silt and vegetable matter, which a suitable soil contains—exerts as great an influence on the ultimate success of the crop as the amount of plant-food which it can furnish, and that a mixture that is best for one plant is not the best for another in the forcing-houses. During the winter to come, Melons, Cucumbers, Tomatoes, Radishes and Lettuce will be grown in six different soils containing different proportions of the ingredients named above, in order to secure data for study and comparison.

Cornell University.

G. Harold Powell.

Marantas.

THIS handsome genus of ornamental-leaved stove-plants should be represented in every collection. Whether arranged by themselves in groups or intermixed with other plants they never fail to make a pleasing effect. They thrive well in a warm stove with abundant atmospheric moisture, and require a plentiful supply of water at the roots during the summer months while in active growth. After their growth is completed the supply of water should be gradually lessened to induce the plants to rest. They must, however, never be subjected to excessive dryness.

The most common, and probably most convenient, method of propagation is by division of the crowns. This is best done in spring before active growth commences. The plants should

be shaken out and divided, the divisions being placed in a propagating-bed among sphagnum moss where they can have the benefit of a genial bottom-heat. They need to be syringed lightly two or three times a day, so that the moss is kept moderately moist.

As soon as they have made sufficient new roots they should be lifted with the moss adhering and potted up. An open fibrous compost is necessary; this may consist of fibrous loam peat, rough leaf-mold and a little sharp sand. We have sometimes seen sphagnum added to the compost, but this is only necessary when the loam and peat lack fibre and the compost is apt to be too retentive. In this, as well as in subsequent pottings, it is important to provide sufficient drainage and to fill the pots well up with the compost to avoid stagnation.

The varieties of *Maranta* are numerous and varied, ranging from a few inches to about three feet in height, and differing considerably in form of leaf, style of marking and variation of color. A few of the best varieties in general cultivation are *M. Chimbacensis*, *M. Kerchoviana*, *M. capitata*, *M. Lindeni*, *M. Leitzei*, *M. media-picta*, *M. rosea-picta*, *M. virginalis major*, *M. exima*, *M. Veitchii*, *M. Wallisii discolor*, *M. Warscewiczii*, *M. Massangeana* and the old, but indispensable, *M. zebrina*.

Tarrytown, N. Y.

William Scott.

Ipomoea imperialis and Imperial Japanese are the dealers' names for some very charming new Morning-glories introduced this season. They appear to be selected hybrids, probably *Ipomoea hederacea* and some other large-flowering species. The leaves vary between three-lobed forms deeply cut to Ivy-leaved. In some varieties they have bright silvery variegations very clearly defined and attractive. This seems to be a novel feature in this strain. As some varieties have been named, we are enabled to make some notes as to the colorings, premising that they are all strong growers with thrifty foliage and produce freely flowers of the largest size and fine substance. *Antigone* has variegated leaves and blue flowers with a pink throat; *Aglia*, with the same leaves, produces rich crimson flowers with a white throat; *Aseria*, with green leaves and flowers of most curious dull copper-red. Some of the plants supposed to be of this variety gave other eccentric colors, mostly dull mixtures of reds and blues difficult to describe. *Ceres* is very like *Aglia*, but with a broad white margin to the carmine flowers. One of the most exquisite varieties is *Euphrosyne*, with variegated leaves and the purest white flowers with dainty pink throats. Other varieties have flowers of royal blue with white borders, and others still are light blue, ranging through the most delicate shades. The seeds of this strain germinate as readily as the ordinary *Ipomoeas*, and, no doubt, they will prove a satisfactory addition to our long list of attractive climbers.

Elizabeth, N. J.

J. N. Gerard.

The Golden Pocklington Grape.—I never knew the full value of this grape until the present season, when early ripening has brought it into perfect condition. It bears enormously heavy crops, and the fruit keeps in good condition for a long time. Its flowers are self-fertilizing, and they furnish abundant pollen for other varieties. The color of this grape is singularly beautiful, although its translucent yellowish white is rarely seen in perfection in the fruit as marketed. The bunch is large and finely formed; the berries are very large and never drop, nor do they decay and lose their flavor as soon as they are ripe. The flavor is slightly musky, but very rich. Best of all, it has a character which gives it a certain distinction among the many tame-flavored grapes.

Clinton, N. Y.

E. P. Powell.

Correspondence.

The Palm-houses at Washington.

To the Editor of GARDEN AND FOREST :

Sir,—The low roofs of the Palm-houses in the Botanic Gardens and Agricultural Department at Washington have made it necessary to sacrifice many rare and beautiful specimens for lack of space. In nearly every case the plants were in the best of health and could only be duplicated by long patient years of cultivation. A few years ago a specimen of *Livistonia Chinensis*, at that time the largest in this country, had to be thrown out for lack of head-room. A fine specimen of *Cocos butyracea* was thrown out of the Palm-house of the Department of Agriculture for a similar reason. In the Botanic Gardens there are now three monarchs of the jungle awaiting their sentence. The first of these is a *Phoenix sylvestris*, a perfectly developed specimen fifty feet high, with a trunk six

feet in circumference. It was sunk in the ground a few years ago, but has grown since until its leaves are now pressing against the roof of the house. It is considered the handsomest specimen of the species in cultivation. A noble specimen of the rare Sugar Palm, *Arenga saccharifera*, is the second plant which has outgrown the largest house, and has been kept within bounds by cutting off the ends of the leaves, in the hope that it would flower and ripen seed; but the plant is in too robust a condition, for this species begins to flower only when enfeebled by age or other trying conditions. It then begins to flower at the top and keeps on producing a bunch in the axil of each leaf one after another downward, until the plant is exhausted. This season one of the immense leaves has broken through the glass and now towers twenty feet above the roof outside. The third tree, which will soon have to be removed, is *Acrocomia sclerocarpa*. It is impossible to do anything more with this one, as several years ago it was sunk about six feet in the ground to give it increased head-room, and it has now filled all the space above.

Botanic Garden, Washington, D. C.

G. W. O.

Lake Keuka Vineyards.

To the Editor of GARDEN AND FOREST :

Sir,—The grape crop of the lake region of central and western New York is considerably below the average this season, owing to the unexpected and unusual freeze of last May. The greatest damage was done in the Chautauqua district. There the yield this season is estimated at 12,000 tons, or, about one-half of last year's crop.

The grape crop of central New York—that is, of the vineyards of Keuka, Seneca, Canandaigua and Cayuga lakes—was estimated last year at 20,000 tons, whereas this season it is doubtful if there will be above 17,000 tons. It was expected that the decrease in yield would result in better prices, but thus far there has been no advance over last year, when the crop was large. About two cents a pound is received for Concords, and two and a half cents for Catawbas. The majority of grape-growers complain that there has been but little profit in the business during the past four or five years, due to overproduction. Some have pulled up their vines, burned their grape-posts for firewood, and are raising other crops on lands that a few years ago were bearing grapes.

The shores of Lake Keuka are well adapted for viticulture, owing to soil, climatic conditions and other natural advantages. The lake itself is a lovely sheet of water about twenty-four miles in length, with sixty miles of shore-line banked by rows of trellised Grapevines. Keuka is the Indian name for crooked, and Keuka Lake is shaped like the letter Y. At the base of the Y, in what is called Pleasant Valley, is the village of Hammondsport, now the headquarters of the wine-making industry, there being no less than eight wine cellars within a radius of ten miles. At the end of one of the arms of the Y is the thriving village of Penn Yan, from which more table grapes are shipped during the season than from any other place in the state.

The grape industry began along the shores of Lake Keuka almost fifty years ago. It is said that the first grapes grown out-of-doors which found their way to the New York City market were raised at Hammondsport, and were sent about 1850 by the way of the Erie Canal. The pioneer grower is said to have forwarded 200 pounds the next year, and the New York market broke under so heavy a shipment. About 1860, however, the Lake Keuka grape industry was fairly established, and it continued to prosper, so that in 1890, when the statistics of viticulture were collected for the first time in the United States, it was found that there were about 10,000 acres of vineyard in the lake country, or 15,000 acres in the entire district. In that year the crop amounted to 20,000 tons, or 40,000,000 pounds of table grapes, while 10,000,000 pounds were used by the wine-makers.

The surface of the Lake Keuka hillsides is gravel and shale on calcareous rock. The soil seems poor, and even weeds find no encouragement, but it produces the finest and sweetest Catawba grapes. The vines flourish in dry, loose gravelly, porous soil, where the air and warmth can penetrate to the roots. In early spring the crust of ice on the lake makes the air cold enough to retard the opening of the buds until the usual danger of frost has passed. In autumn the water exerts a similarly favorable influence by retaining summer's heat, and the warm breezes from its surface protect the fruit from early frosts in September. This difference in temperature is shown by the fact that vineyards a mile or two back from the lake do not do well, and are often ruined by cold waves or frosts.

The climatic conditions are favorable to the ripening of late

varieties of grapes. These are usually the best keepers, and the Lake Keuka grapes have thus a long range of season. The shipping season begins about September 1st, with early varieties such as Delaware, Moore's Early and Concord. Catawbas come into market about the first of October, and, now that the art of keeping them is understood, table grapes are shipped all through the winter months until March or April.

The methods of cultivation are about the same as in other vineyard districts, but the pruning is different from that in the Hudson River region, where the Kniffen system is used, and from that in the Chautauqua region, where the fan system is popular. In the Lake Keuka district the vines are pruned and trained by what is known as the "renewal system." Two main horizontal canes are trained permanently along the lower wires, one to the right, another to the left. New arms are formed every year. A few spurs are left near the centre of the vine, and shoots that come from the buds are used the next year. This system is the result of much experience, and seems best adapted to the Catawba vines, which grow straight up. At one time the Lake Keuka grape industry was threatened with ruin from black-rot, but the use of Bordeaux mixture has saved the vines.

Almost every person owning land along the lake has a vineyard. Farmers who do not make a specialty of grapes have vineyards of five or ten acres, while those who make a business of grape-growing maintain from thirty to forty acres, and expect to clear from \$1,200 to \$1,500 a year. There are some vineyards of seventy-five to a hundred acres. The largest along Keuka Lake are those of the Urbana Wine Company and the Keuka Vineyard, consisting of 125 and 110 acres, respectively.

Penn Yan, N. Y.

L. J. Vance.

September Wild Flowers.

To the Editor of GARDEN AND FOREST:

Sir,—A recent drive around the head of Klinger Lake on a roadway through a marsh devoted to the cultivation of Pepper-mint introduced me to a varied flora as well as a grand display of fruits, which were often more showy than the flowers. Asters of various shades were in their prime, and among Golden-rods, too numerous to name separately, Solidago odorata and S. Riddellii were most rare. Gentiana saponaria is less beautiful than the famed Fringed Gentian, but the plants were fine specimens and interesting for their comparative rarity.

The Harebell, Campanula rotundifolia, was flourishing on sandy slopes in company with the Scouring Rush, as much at home, to all appearance, as when perched in the clefts of rocks through which water trickles.

The finest specimens of Rattlesnake-root, Prenanthes alba, I have ever seen were standing from four to five feet high, with the upper half of the stems covered with racemes of drooping flowers, forming a corymb of striking beauty in delicate tints of purple and pure white. The plant is certainly worth a place in parks and large grounds. The tall Coreopsis, C. tripteris, and several species of Bidens, of which B. chrysanthenoidea was most noticeable, grew along a ditch, and the groups were charmingly brightened by Helianthus occidentalis, while the road-track was beautifully fringed with pink Polygonums of various species.

Through the shady woodland grew masses of Fern, and ripening fruits hung in many colors. Cornus florida showed its dark scarlet berries; C. stolonifera, its large clusters of white; the Alder, Alnus incana, its brilliant scarlet, as were also those of the Spicewood. The foliage of both species of Cornus was curled and faded, and we shall miss the soft tints so characteristic in later autumn. The change was due to a slight frost, perhaps, though no other signs of it were manifest. The Witch-hazel still held its seeds close in their green covering, waiting for the maturity which only comes with their fresh flowers in November, and the Hazels were loaded with their curiously wrapped nuts, to the joy of children and squirrels.

This locality is a rich field for the botanist at all seasons. In July, Zygadenus elegans was found along the stream, an uncommon plant here, with greenish flowers and narrow, almost grass-like, leaves. Not far away on the border of a smaller lake, in which the water has been unusually low this season, have sprung into bloom two Utricularias not seen there before. U. resupinata bloomed in July, while U. gibba, by some means belated, is now, September 25th, in full flower. I have the authority of Mr. C. F. Wheeler, of Michigan Agricultural College, for saying that "plants which flourish along sandy borders of lakes do not produce flowers when the water is high, but when favorable conditions appear they expend all their strength in producing flowers and seeds, the latter sometimes

lying buried in sand for years until again exposed to light and the proper conditions of growth."

I have noted this season some plants not common in the locality, among them Baptisia leucantha, with erect growth of rigid stem sending out three branches and a raceme of white flowers.

It is to be regretted that several of the Orchis family, among them the white-fringed and yellow-fringed Orchis, have disappeared from the low land upon which they grew a few years ago.

White Pigeon, Mich.

Dorcus E. Collins.

Recent Publications.

The English Flower Garden. By W. Robinson. John Murray, London; Charles Scribner's Sons, New York.

This is a new edition of the book which was first issued twelve years ago and took its place at once as a standard manual of garden plants and garden designs. It has been out of print for some time, and we are glad to make a note of its reappearance in an enlarged and improved form. The book is so well known that it is hardly necessary to describe it. The first part of it treats of garden designs in connection with the house and its surroundings, and shows in how many ways the different classes of hardy and half-hardy flowering plants in their infinite variety can be arranged so as to make the garden beautiful and present renewed attractions every day all the season through. Several simple, though tasteful, garden plans are mapped out and described, and on almost every page is an engraving of admirable quality to emphasize some lesson or hint at some practical combination or to set forth the beauty of some special flower or plant. The teaching in these two hundred and fifty pages is certainly in the right direction, and there is little doubt that the book has done much to relieve English gardens of stiffness and formality, to curtail what was once the prevalent practice of filling them with tender bedding-plants arranged in set patterns, and to make them natural in the best sense of the word—that is, suggestive of such combinations of form and color as nature presents in her happiest moods.

The second and larger part of the book is an alphabetical list of flowering herbaceous plants, shrubs, trees and climbers which can be used in English gardens, with brief descriptions of them and directions for their cultivation. This descriptive list is large, filling some six hundred pages, but even with so much space many plants must, of necessity, be omitted. Among the Syringas, for example, we see no mention of such well-known species as S. oblata, nor of more recent introductions like S. villosa or S. pubescens, which have proved themselves among the best of garden shrubs in this country. Some of the most interesting American and Asiatic species of Viburnum are not named. Several pages are devoted to the Clematis, with long lists of garden hybrids which can be used in various places, but, although our well-known C. coccinea is spoken of as a "remarkable and very distinct novelty," there is no mention of such species as C. paniculata, C. crispa and many others of the highest decorative value. A casual glance at the account of shrubs and of woody or half-shrubby climbers will detect many omissions which will surprise the American reader, some of them due to the fact, no doubt, that this class of plants does not flower as well in England as in our own drier climate, where the wood has a better chance to ripen. There is no doubt, however, that the list could be greatly improved by careful editing by some one who has an eye to perspective and appreciates the comparative value of plants, so that the reader will be able to apprehend more clearly the relative rank of different genera and of different species and varieties.

It is often said, and said with some truth, that the climate of England differs so widely from our own that cultural directions adapted to an English garden will have small value to Americans. The climatic differences of the two countries, however, are well known, and a little observation and practice will soon enable the American reader to make due allowances for the different conditions. The

book is, therefore, a useful one for any reader, and we repeat that all Americans who are interested in the refinements of gardening will be gratified to know that its beautiful and instructive pages have been reprinted.

Notes.

The Midland Railroad Company, in England, offered last spring prizes amounting to \$1,000 for the best gardens at their various stations, and two hundred station-masters entered into the competition.

In Bulletin No. 34 of the Experiment Station of the Mississippi Agricultural and Mechanical College, S. M. Tracy and F. S. Earle print a list of fungi which have been found at different times in Mississippi. Of the 353 species in this list, fifty-five, or nearly one-sixth, are described as new to science.

The Lemon groves of California have this year given small fortunes to their owners. The growers have learned to cure the fruit so that it compares favorably with imported lemons and the crop is large. A correspondent of *The Tribune* writes that the product of groves planted ten years has amounted to as much as \$3,600 an acre this year, of which at least one-half is profit. We apprehend that it must be a good grove and a good year to insure such results.

While vegetables have been destroyed by frost in some localities, peas continue to arrive from Long Island, and sell at fifty cents a half peck, and Lima beans of good quality bring thirty-five cents. Good corn may still be had for thirty-five cents a dozen. The last cucumbers come now from Shelter Island; these sell for five cents each, and the first hot-house cucumbers from Boston bring fifteen cents apiece. Lettuce and cauliflower are of good quality and reasonable in price, and tomatoes cost one dollar for a crate holding a bushel.

Number 1 of the first volume of the botanical series of the publications of the new Field Columbian Museum, at Chicago, is devoted to a contribution to the flora of Yucatan, by Charles Frederick Millspaugh, curator of the department of botany in the Museum. The collection which forms the basis of this paper was made in January of this year, during an expedition to the ruined city of Chichen Itza and the islands of Mugeres and Cozumel. The expedition was planned and carried out by Mr. Allison V. Armour, of Chicago, and was made in his steam yacht.

To the long list of hybrids raised by Monsieur V. Lemoine, of Nancy, must now be added *Astilbe Lemoinei*, obtained by crossing *A. Thunbergii* and *A. (Spiraea) astilboidea floribunda*. The new hybrid, which is a plant of elegant and graceful habit, grows about twice as high as *A. astilboidea floribunda*, and its period of flowering is intermediate between its parents. Monsieur Lemoine informs us that his new hybrid is not only perfectly hardy, but forces as easily and satisfactorily as the well-known *A. Japonica*, which, in his judgment, it surpasses from all points of view.

A special circular has been sent out by the New Jersey Experiment Station on the subject of Sulphur as a Preventive of Scab and Soil-rot in Potatoes. We alluded to Professor Halsted's experiments on the subject last week, and this circular, with the illustrations which show the advantages of this treatment in a striking way, is preliminary to a bulletin which is soon to be issued. The experiments give promise that the soil-rot, which has been very destructive to Sweet Potatoes in New Jersey, as well as the scab of Irish Potatoes, can now be controlled in a cheap way.

Of course, no fixed date can be named as the proper one for picking pears which are to be ripened in the house. To inquiries on this matter we can only say that a pear should be picked as soon as it easily separates from the branch when it is lifted. Messrs. Ellwanger & Barry, in reply to some inquiries on this subject, say that with them Anjou and Lawrence pears are picked as soon as they are full-grown, which is in that locality from the tenth to the fifteenth of October. They will shrivel if they are taken earlier. Winter Nelis, Duhamel, P. Barry, Josephine, Easter Beurre and other winter pears are better left until the latter part of October, unless heavy frosts occur, when they should, of course, be picked earlier.

Small lots of good peaches are still coming from Maryland, although the main crop from that state and from Delaware is past. Most of this fruit from northern New Jersey is small, owing to the extreme dry weather. Late Rareripes from the

Hudson River district are among the highest-priced peaches now offered, with Keyport Whites and Salways from the same section. Selected fruits of these showy varieties sell for \$2.50 a basket. Flame Tokay grapes from California, fully ripened, make a bright show on the fruit-stands with Black Moroccos, Cornichons and White Muscats. Coe's Golden Drop from California, and Italian prunes from Oregon, are among the latest shipments of this fruit. Lemons are gradually settling to ordinary prices, a fall of \$2.00 a box having occurred during the past week, and limes, which a fortnight ago brought \$18.00 to \$20.00 a barrel, now cost but half as much.

A correspondent of *The Garden* speaks of the Rose La France as one of the best varieties for autumn flowering. We can add that in many gardens near this city this Rose makes a better display of flowers in autumn than in June. The outer petals are apt to turn brown early in the season, but when cool nights come the flowers are larger, more perfect in form and even more odorous, if possible, than at any other time. We have in mind a specimen plant of this Rose which has been standing out-of-doors now for six or seven years in a rather exposed position, and it is showing flowers by the dozen every day. Of course, water has been a necessity in this exceptionally dry year when there seems to be absolutely no moisture in the soil which can be reached by the roots of ordinary shrubs, but usually our autumn rains can be trusted to supply all the needs of the plant.

The *Agricultural Gazette*, of New South Wales, in speaking of the Colonial or Moreton Bay Pine, Araucaria Cunninghamii, states that in that colony it is the principal cheap soft-wood timber, and has taken the place of deal from Europe for packing-cases and other rough purposes. The timber goes under the name of white pine or Richmond River pine, and most of the planks show more or less of the figures similar to those in bird's-eye maple, so that in selected planks where these are numerous the wood is classed among ornamental timbers. On Richmond River the Colonial Pine grows to one hundred and fifty feet high, with a trunk four or five feet in diameter. When one of these trees decays in the forest a number of club-shaped pieces of wood, one or two feet long, and known as pine-knots, remain, owing their durability to the large percentage of resin they contain. Carters collect these knots and sell them for firewood, as they are considered much the best fuel in the district. It seems a pity, however, to put them to such a use, as the wood is of the most ornamental character, especially in longitudinal section. It is dark-colored, of various shades of brown, showing a most beautiful figure, and would be an ideal material for small articles of turnery. If this material were better known it might form the basis of a minor industry, much in the way that small articles are made of bog oak in Ireland. The substance turns like bone and comes polished from the tool.

In a bulletin on Cherries, prepared by Professor L. H. Bailey and his assistant, Mr. Powell, the cultivated tree Cherries are divided into two horticultural groups: (1) the Sour Cherries, derived from *Prunus Cerasus*, and characterized by a diffuse round-headed growth and a habit of suckering from the root, with flowers in small clusters from lateral buds, generally preceding the hard and stiff leaves, which narrow abruptly to a point, and roundish, red, soft-fleshed and sour fruit; and (2) the Sweet Cherries, supposed to be descended from *P. Avium*, of tall erect habit, bark tending to peel off in birch-like rings, flowers in dense clusters on lateral spurs, appearing with the more or less limp and gradually tapering leaves and variously colored, spherical or heart-shaped fruit, with flesh either soft or hard and generally sweet. The Sour Cherry class includes two types: the Amarelles, with pale red fruit, generally flattened at the ends, and with uncolored juice, and including Montmorency, Early Richmond and their kin, and the Morellas or Griottes, with very dark red fruits, generally varying from spherical to heart-shaped, and dark-colored juice, including the various Morellas, Ostheim, Louis Philippe and the like. The Sweet Cherry group is represented in this country by four types: the Mazzards, with small fruits, represented by miscellaneous inferior seedlings, and including the trees common along roadsides and wood-borders, where the seeds are scattered by the birds; Hearts or Geans, with a soft-fleshed, heart-shaped fruit, represented by Governor Wood, Black Eagle and Black Tartarian; Bigarreaus, hard-fleshed cherries, mostly light-colored and heart-shaped, including Windsor, Napoleon and Yellow Spanish; and the Dukes, which differ from the Heart cherries chiefly in having an acid or subacid fruit, and include the May Duke, Reine Hortense and Belle de Choisy and a few more.

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLE:—Forestry for Farms.....	411
Seacoast Planting.....	<i>Leonard W. Ross</i> , 412
A Season with the Native Orchids.—I.....	<i>Rev. E. J. Hill</i> , 412
FOREIGN CORRESPONDENCE:—London Letter.....	<i>W. Watson</i> , 412
NEW OR LITTLE-KNOWN PLANTS:— <i>Yucca Whipplei</i> . (With figure)	414
PLANT NOTES.....	415
CULTURAL DEPARTMENT:— <i>Oncocyclus Irises</i>	<i>J. N. Gerard</i> , 416
The Vegetable Garden.....	<i>W. N. Craig</i> , 416
Indoor Work.....	<i>W. H. Taplin</i> , 417
<i>Polyscias paniculata</i> , <i>Tricyrtis hirta</i>	<i>G. W. Oliver</i> , 417
Frost Injuries to Pears and Apples.....	<i>G. Harold Powell</i> , 417
CORRESPONDENCE:—Seasonable Notes from Wellesley, Massachusetts,	<i>T. D. Hatfield</i> , 417
A Few Climbing Plants.....	<i>Fanny Copley Sealey</i> , 418
MEETINGS OF SOCIETIES:—The American Dahlia Society..	<i>Professor L. H. Bailey</i> , 418
RECENT PUBLICATIONS	419
NOTES.....	420
ILLUSTRATION:— <i>Yucca Whipplei</i> in Southern California, Fig. 56.....	425

Forestry for Farms.

MANY writers and speakers have argued strenuously to prove how important our forests are as factors in the public economy. The direct usefulness of forest products and the influence of the forest-cover upon soil and temperature and drainage, and therefore upon climate and health, have been insisted on until the subject has become an old story, and a story with little meaning to very many good people. The strongest appeals to Congress for the protection of our national forest domain have been made on these broad considerations, and yet, although the testimony of science and of history ought to convince any candid mind, comparatively little has been effected in this direction. Besides this, persistent effort has been made to convince the holders of large areas of timber that it would not only be to the common welfare, but would accord with wise business forethought, to conduct their lumbering operations without the usual waste, and in accordance with the principles and practice of sound forestry. These teachings may have helped to prepare the way for a better system, but their results as yet are hardly visible.

Little direct effort, however, has been made to inaugurate wiser methods of treating woodlands on the farm. It is true that from many farms in the eastern states all the growing wood has practically been removed, but on the most of them a fair proportion of woodland still remains, and, except for the fact that they are not so frequently burned over, these small holdings are wasted and treated with as little intelligence and prudence as are the forests on the national domain. The amount of timber which comes into the market every year from the little wood lots on a thousand farms is enormous in the aggregate, and this supply has been a considerable factor in keeping down prices. Since the introduction of portable sawmills acre after acre of fair timber has been cut over, and as no provision has been made for a new crop the productive timber area is constantly diminishing. About ten years ago a lumberman brought one of these mills into a county of northern New Jersey. It was considered a perilous venture, for it seemed, on a casual survey, that all the available timber in the scat-

tered wood lots of that section would be exhausted within half a dozen years at the farthest. But the same man has four mills now working, and competition has brought in six others, so that there are ten mills constantly at work on these isolated lots of timber. As it is the general practice of the farmers there to turn cattle into the cleared land there is little hope for any forest-growth here for a generation at least.

For this reason a little manual, entitled *Forestry for Farmers*, which has been prepared by Mr. Fernow and reprinted from the *Year-book of the Department of Agriculture*, ought to be welcomed for its possible usefulness. The farmer rarely treats his wood lot as if he considered it a source for the continuous supply of firewood, fencing and such dimension timber as he may need. When he wants a stick for any purpose he chooses the best tree he can find, and his laborers too often select trees for firewood which will cut and split most readily. In this way he not only culls out the best species of trees, but the best individuals of the species, and leaves the crooked and comparatively useless ones to cumber the ground. The folly of such practice would only be paralleled if he cut away his corn crop and left the weeds to grow. In a few brief paragraphs Mr. Fernow shows that no farmer need destroy in this way a source of revenue, and explains how the forest can be constantly used, and yet steadily improved, so that the wood lot will preserve its ability to furnish a timber crop, and as time goes on will have better kinds of wood to cut and better individual trees. No owner of woodlands can read the paragraphs on Reproducing the Wood Crop without being convinced of the extravagance and waste of resource which characterizes the ordinary wood-cutting on the farm or without seeing clearly how it is possible at once to use and to regenerate the woods.

"Forest-planting and tree-planting are two different things. The orchardist who plants for fruit, the landscape-gardener who plants for form, the roadside-planter who plants for shade, all have objects in view that differ from those of the forest-planter, and, therefore, they select and use material differently." These words begin the chapter on Forest-planting, which is written for farmers or small land-holders who have not already a lot of growing timber, and in the few pages devoted to the subject of starting timber plantation many very useful hints are given. These hints are all directed to methods which will produce the most wood of the best quality to every acre, for the object sought for is a crop, and not individual trees, any more than a spear of corn is considered by itself in preparing for a corn crop. Interesting hints are given about selecting trees for this crop, and the farmer who reads carefully the notes about their adaptability to climate, to soil, to situation, besides the necessity of selecting species not only for the usefulness of their wood, but for their general good influence upon the forest mass—that is, the total crop—will readily see how easy it is to make mistakes at this point which will be more disastrous because their effects are not seen for several years.

But, although to the forester the individual tree is only useful as a part of a mass, the successful planter must have a considerable knowledge of the various elements of his mass if he is to have the most profitable crop. Very appropriately, therefore, this little manual opens with a chapter entitled How Trees Grow, in which a few of the essentials in the behavior of a forest-tree are set forth. Some knowledge of the physiology of tree-growth is necessary both to one who cares for an established forest and one who plants a new one, and most interesting are the paragraphs which treat of such subjects as the food materials of the tree, the conditions of soil and light necessary to its development, its growth in length, in ramification and in thickness, its varying form and means of reproduction. Like the chapters which follow, this initial one is illustrated with some helpful cuts, and the book throughout is written in a straightforward style with the topics logically connected. Any intelligent farmer can comprehend it from end to end.

It will be of service to him in his immediate work, and, best of all, it will inspire him with a desire to learn more.

Improvement in forest practice will only come with increased knowledge, and these scattered bits of woodland, which would make a forest much larger than many of our states, will never approach their real value as a national resource until their owners have been educated to give them more intelligent treatment. Let us hope that this increase in knowledge will be speedily brought about, not only for the good of the farms and the timber on the farms, but as an assurance for a rational system of treatment for forests of the nation. If every wood lot on the farms of the country were now an object-lesson in good forest practice, it would be easy enough to secure proper legislation for the forests on the national domain.

Seacoast Planting.

AT the late meeting of the American Forestry Association, in Springfield, Massachusetts, Mr. Leonard W. Ross, of Boston, delivered an address on the subject of seacoast-planting as practiced on the Province lands of Cape Cod, where an effort is made to prevent the shifting sands at the extremity of the Cape from injuring settlements and the harbor. Mr. Ross has kindly sent us an abstract of his address, which we herewith publish:

The first work in connection with seashore planting should be a careful study of the individual case to be treated, as no two instances will be found to carry identical or even parallel conditions. Specific instruction to apply in every case is, therefore, out of the question, and only general suggestions can be made for solving such problems. The material for planting should in all cases be in the best possible condition. The area to be covered should be carefully prepared before actual planting begins. Of course, the results which might follow an equal effort inland, or in sheltered situations, or in better soil, need not be expected. The soil to be planted is usually thin and sterile, if, indeed, it is anything better than sand. In nearly all cases it is best to make thick border plantations on the water side of rapid-growing trees and shrubs which have resistant power against salt and wind, and among these may be planted longer-lived and more sturdy-growing kinds, the former acting as a nurse or protection to the latter in their earliest days. When this has become established, other plantings may be made behind it with some certainty of success.

It is generally supposed that the number of species adapted to this use is extremely limited, but experience shows that such is not the case. It becomes not so much a question of what to plant, but rather how to plant. In preliminary plantings the plants should always be set very closely, that one may protect the other. A good mulch should then be placed over the entire area and loaded down with stones such as may be usually found on the shore; the stones not only hold the mulch in place, but assist materially in retaining moisture during the dry season. Spring planting is safer than fall planting. It not infrequently happens, however, that plants set in early spring break into growth at once; then late spring storms follow, the tender growth is killed off and a secondary growth follows. This weakens the plants, and only such kinds as can endure these conditions should be used, especially for preliminary work. This may be avoided in a great measure by holding back the growth of the plants, by frequent transplantings in the nursery until the season is well advanced. Deep planting is found to be the safest in nearly all shore work, as the drainage is usually excessive.

Planting on the Province lands of Massachusetts, although still in its infancy, so far as the work under the present administration has gone, has now passed the experimental state and is being developed into a system at once conservative, thorough and energetic. The entire area (over 3,000 acres) consists only of sand. A considerable portion of this is covered with a surprisingly luxuriant growth of trees and shrubs, deciduous, evergreen and coniferous, together with many creepers and climbers. On the outer or ocean side are many hundreds of acres of wildly drifting sand-dunes or areas covered to a greater or less degree by Beach Grass, *Ammophila arundinacea*, and in the hollows and low places with other grasses.

Many thousands of dollars have been expended in Beach Grass planting, and, while this has not been wholly in vain, it has failed to hold the sand securely in place. If properly watched, and all breaks attended to when first started, the

Beach Grass might hold the sand in check, but it would require constant attention. It is thought safest to cover the area with a growth of woody plants and trees. There is abundant evidence that this outer area was formerly covered by forest-growth, principally of Pine; the original layer of mold, with portions of stumps and pitchy heart-wood, is now frequently uncovered as the sand-hills recede inland.

Experimental plantings were first made by us in April, 1894. Of the plants not blown out, or buried many feet deep by drifting sand, a fair proportion lived and made a satisfactory growth, but most of them were so cut by the drifting sand the following winter as to die to the surface of the ground. We have this year established a nursery on the lands for the propagation of stock to be used in future work, in preference to using imported plants, and shall extend it as our needs demand. We have now growing in the nursery over 250,000 young trees and shrubs, mostly raised from seed. Our stock of trees consists mainly of Pines (*P. rigida*, *P. Austriaca*, *P. sylvestris*, *P. Strobus*, *P. insignis* and *P. Pinaster*), Alder, Birch, Hornbeam, Ailanthus, Oaks, Silver Maple and several varieties of strong-growing Willows and Silver Poplar. Of shrubs, we have Privets, Scotch Broom (*Cytisus scoparius*) in large quantity, *Myrica cerifera* and a few others, intending to put in next year several other kinds of native growth, as well as *Tamarix Gallica* and such others as may promise to be of service in this work.

We make a preliminary planting of Beach Grass, setting strong clumps eighteen to twenty-four inches apart. This makes sufficient growth the first year to nearly cover the ground and to reach a height of about two feet. The following season we plant among this such woody plants as *Genista scaparia*, *Myrica cerifera*, *Amalanchier Canadensis*, *Rosa lucida*, etc. Among these we intend to plant at the same time a considerable quantity of acorns of our native Oaks, to be followed in a year or two with the several varieties of Pine and other trees. Outside and to the windward of this we are making thick wind-break plantations of strong Willows, Silver Poplars, Locust, etc.

It is expected that in time this entire area may be covered with a forest-growth which will not only serve to prevent the sand from drifting inland toward the town of Provincetown, and eventually filling and destroying a useful harbor, but will at the same time furnish a practical example of reforesting waste and useless land, of which our state has many thousands of acres now producing nothing of value.

A Season with the Native Orchids.—I.

TWENTY-EIGHT species of Orchids, representing eleven genera, have been found indigenous to the vicinity of Chicago. *Orchis spectabilis*, the Showy Orchis, opens the flowering season the latter part of April, and continues until late in May. It is a plant of the rich damp woods, rooting in the mold of decayed leaves and wood, and often growing in little patches. It makes a pretty picture amid the dry leaves and fresh verdure with its two shining, rich green leaves near the surface of the ground, and its pink or purplish flowers with white oval lips on the short stem between them. It is one of the handsomest of the Orchids, its showy flowers well entitling it to precede the others of the family.

Before the flowering season of *Orchis spectabilis* is over, that of *Aplectrum hyemale* begins. This is a plant more curious than handsome. Its single oval leaf, strongly ribbed or plaited, persists through the winter, and frequently leads to the destruction of the plant by children, who know there is a white savory bulb from which it grows, and sometimes an older one not so shrunken as to be unpalatable. One or two more shriveled bulbs remain attached, and their sticky nature has given the plant the name of Putty-root. The largest and freshest of these bulbs sends up a vigorous stem in May a foot or more tall, which bears several large dingy greenish or brownish flowers, their lips sprinkled with purple dots. The leaf at the base of the stem is now dying or dead, and the purple flower-stem may be the sole reminder of the presence of the plant. Like the Showy Orchis, it loves the rich shady woods, but is quite rare outside of the Beech and Maple woods east of the sand region.

Closely following the Putty-root are four species of

Cypripedium which come into bloom the latter part of May. All six of the species of the territory covered by Gray's *Manual*, except *C. arietinum*, are represented in our local flora. They can all be found in the Pine-belt of Lake County, Indiana, within half a mile of Lake Michigan, and in a strip but four or five miles long. Of the four species the Stemless Lady's-slipper, *C. acaule*, may flower as early as the 20th of May, and it continues for about three weeks. The two oval-oblong, ascending leaves, and the one-flowered scape, four to twelve inches high, which rises between them, give it an appearance quite different from the kinds with leafy stems. A green and pointed bract arches over the flower and points in the direction of the upper sepal, lying very close to it. The narrower parts of the perianth are greenish, but are veined and tinged with red. The shape and color of the inflated sac, nodding on the scape, make it one of the most beautiful of the Lady's-slippers. It is about two inches long, of a deep rose color, veined by a network of deeper-colored lines. When the bright sunlight shines through the lip it is suffused with a very rich color, for the deeper color of the veins blends with the general color, and the flower blushes almost to a crimson shade. Though only single-flowered, a dozen or more plants in bloom together in a narrow area produce a very showy effect. They grow in the deep or partial shade of the Jack Pine in sands enriched by a mulch of decaying leaves, where their nodding flowers make a charming picture. The haunts of the Stemless Lady's-slipper are usually the lower parts of deep depressions among the sand-hills. They are often nearly circular, and resemble kettle-holes. In the bottoms of the deepest of them water may accumulate in the wet season. From the borders of these temporary pools, or from the bottoms of the depressions that continue dry, the plants spread away and line the lower parts of the surrounding slopes, which are often very steep. It forms a strange setting, botanically and geographically, for this Cypripedium, and different from any I have seen it take elsewhere.

Cypripedium candidum, another early bloomer, the smallest of the Lady's-slippers, is from three to ten or twelve inches high. It is the only one that grows in the open prairie, where it occurs in boggy or hummocky ground or in wetish grassy land. It persists in the unplowed meadows after they have become quite dry, and may be found growing beside the Blue and the Arrow-leaved Violets or even with *Viola pedata*. In the Pine-barrens it frequents the bogs and damper sands, growing in the shade of White and Jack Pines, or even the Black Oaks, which have supplanted them. It has light green foliage. The small flower is very sweet-scented, the slipper rarely more than an inch in length. This is white or pinkish, translucent, and variously striped and specked with dark red inside, the red veins showing through the thin texture and giving it the pinkish tint. The base of the slipper is stained with yellow, and its opening is prettily bordered by a row of red dots. The rest of the perianth is brown-purple, the parts twisted and wavy, the two answering to petals long and ribbon-like. The stem is mostly single-flowered, one with two flowers being occasionally found. The small White Lady's-slipper is becoming scarce upon the prairies, and is likely to be extinct in such places, as plowing and pasturing soon destroy it.

The two Yellow Lady's-slippers, *Cypripedium pubescens* and *C. parviflorum*, bloom together, and are much alike. The former is generally a more robust plant, sometimes two or more feet high. I could never find much difference in the form of the sacs, though there seems to be a tendency in that of *C. pubescens* to be more flattened laterally. But it is usually much larger and more inflated when compared with the size of the plant, sometimes two inches long and nearly an inch broad. The sepals of *C. parviflorum* are brown-purple, those of *C. pubescens* more nearly green. Its flower is nearly odorless, that of *C. parviflorum* is fragrant. The latter plant is from a foot to a foot and a half high, the saccate lip rarely more than an inch long. *C. parviflorum* is often seen here in groups,

a half dozen or so in little colonies or a score of them within an area of a few square feet. *C. pubescens* is much more solitary in behavior. In the sand region *C. parviflorum* takes more to the wet and boggy lands, though patches of it may be met with in the rather dry sand in the shade of the Black Oak. *C. pubescens* is scattered about in the Oak and Pine woods in the sandy region by the lake, appearing on the low sand-ridges such as visitors at the Columbian Exposition would find typified in the Wooded Island, and where these plants, doubtless, formerly grew. In such situations the plant is generally found growing close beside the Oak-tree, springing out from among its larger roots, as if it sought the protection and shade of the sturdy Oak.

The handsomest of the group, *Cypripedium spectabile*, flowers latest. It is here essentially a flower of June, and may be found in full bloom soon after the first of the month, so that its season is well over by the first of July. It was once exceedingly abundant in the damp places of the Pine-barrens, but it has been gathered for sale and for other purposes so recklessly, and the region has been so changed by various encroachments, that it is already scarce and seems doomed to extinction. It was most abundant under the Cedars and Pines by the borders of the sloughs, or amid the thin swamp grasses, or in groves of Tamarack or peat-bogs among Pitcher-plants and Cranberries. Few plants of its size have a more stately look, the stout stems, generally two or three feet high, being wrapped in pale green, hairy leaves, which rise so close to it as to nearly conceal the internodes, and are so arranged as to have a spiral appearance. The slipper is chubby, and wide in proportion to its length. Its beautiful roseate tinge, the broad pink stripes within shining through its texture, the setting in its perianth of snowy white, give this queenly plant a peculiar charm. The spreading parts form a kind of canopy beneath which the slipper hangs. The flowers often occur in pairs on the stem, but do not intrude on one another, being turned just far enough away so as not to interfere, though still facing the beholder.

Chicago, Ill.

E. J. Hill.

Foreign Correspondence.

London Letter.

AN EXHIBITION OF FRUIT.—A three-days exhibition of British-grown fruit was held the week ending September 18th, at the Crystal Palace, under the auspices of the Royal Horticultural Society. There were one hundred and eighty exhibitors, from distant parts of the country as well as from the metropolis, and the number of entries in the competitive classes was eighteen hundred. The quality of the fruit shown was of an exceptionally high order, and this was specially true of the apples, which have done well this year in most parts of the country. The President of the Society, Sir Trevor Lawrence, in commenting upon the exhibition on the opening day, said he believed that a finer collection of hardy fruit had never been tabled in any exhibition in the kingdom. He thought English fruit-growers had abundantly proved that when the seasons are fairly favorable hardy fruit could be produced here which could not be beaten in any part of the world. Referring to the correspondence which has appeared in the newspapers with regard to fruit-drying, he said that nothing very special had been done in this country in that direction, and that was partly due to the fact that people did not combine readily for such operations. His own opinion was that in a year of glut such as the present it was exceedingly difficult to market profitably; even in the case of good samples it would be a very great advantage if there were a possibility of sending the surplus fruit to be dried, even if it were only for domestic consumption. A great deal depended, not only upon the growing of fruit, but in its careful handling and careful marketing. No one would suppose the magnificent fruit that was shown was a fair average sample of the produce of the orchards from where it came.

Naturally the producers showed their best fruit. But, as they all knew, this year a very high average sample of fruit had been produced in a great many parts, and he thought that in these days farmers must look, not to the great staples of their industry, but to various branches of small cultivation. Something, at all events, might be done more than is done in fruit-growing and fruit-drying.

As I have said in previous letters upon the cultivation of fruit in England, no exhibitions are needed to prove that the best can be grown here. This is demonstrated in the gardens of the wealthy, where there is no stint of labor and other accessories. But to grow and sell fruit at a profit is the great difficulty in these days of foreign competition. There are many ways of losing money, and we are still searching for fresh ones. The cultivation of fruit in England for profit is an old, well-trodden way, and I am inclined to the opinion that the now recommended drying of fruits is only a bypath in the same direction.

It has been suggested in a paper recently read before the British Association that as growers of farm and garden produce have difficulty in selling it the state should undertake the duties of collecting and selling. A pertinent suggestion was made to the effect that if the Government could market the produce at a profit why not let them undertake its cultivation as well? The poor farmer and market gardener would then be relieved of all anxiety and worry and could become a state-paid official! It would, no doubt, be a gain to the revenue if Government could take the place of the middleman, who always gets a large share of the proceeds.

The premier prize for eighteen sorts of cooking and dessert apples grown in the open air was won with the following: Lord Derby, Peasgood Nonesuch, Alexander, Stone's, Bismarck, Belle Duboise, Belle Pontoise, Gascoigne's Scarlet Seedling, Washington, Mère de Ménage, Warner's King, Cornish Aromatic, Ribston Pippin, Wealthy, Baumann's Red, Winter Reinette, Cox's Orange Pippin and the Queen. This collection came from Maidstone, in Kent, and was remarkable for size and rich color.

The best collection of a dozen sorts of dessert pears comprised: General Todleben, Duchesse d'Angoulême, Pitmaston Duchess, Marie Louise, Maréchal de la Cour, Brockworth Park, Doyenne du Comice, Beurré Bosc, Beurré Superfin, Gansel's Bergamot, Madame Treyve and Beurré Rance. These also came from a garden in Kent.

The best peaches were Nectarine Peach, Sea Eagle and Princess of Wales. The first collection of plums consisted of splendid examples of Monarch, Golden Drop, Jefferson's, and Bryanston Green Gage. The best Damsons were Cluster King, Prune and Farley.

Pot-grown specimens of fruit-trees were splendidly exhibited by Messrs. T. Rivers & Son, Sawbridgeworth, the number and finish of the fruits borne by each small tree planted in a ten-inch pot being at least equal to the best possible trees grown in the open ground.

Messrs. Sutton & Sons exhibited a grand collection of tomatoes arranged on a screen, each sort being represented by about a square yard covered with heavily laden stems, showing the character of the sort much better than when selected fruits are placed upon dishes.

The largest and handsomest apple shown is Peasgood Nonesuch, and it was represented by hundreds of fine fruits. Next to this in point of interest and attractiveness is the recently acquired Bismarck, which is astonishingly prolific and of taking appearance. The two best of all dessert apples, Ribston and Cox's Orange Pippins, were well shown. Prizes were awarded for the best methods of packing fruits for market. Three papers were read, one on each day, the first being by Mr. Bunyard, the Maidstone nurseryman, on New Varieties of Fruit; the second was on Pruning Fruit-trees, by Mr. A. H. Pearson, the Chilwall nurseryman, and the third was a prize essay on Fruit-growing for Profit. These papers will be published in the society's journal.

NEW ORCHIDS.—*Masdevallia Lawrencei* is the name under

which Dr. F. Kranzlin describes a plant which he had received from Sir Trevor Lawrence, but which Mr. Rolfe described in 1880 under the name of *M. guttulata* as a new species allied to *M. Tovarensis*, but with flowers only half as large and colored yellowish white, with spots of purple. It flowered in the Glasnevin Botanic Garden, its origin being unknown. As a garden-plant it has little value, except to those who make a specialty of *Masdevallias*. Dr. Kranzlin's reason for the proposed new name is that Reichenbach had already used the name *Guttulata* for another species published in 1877. "If we go on in this way we shall have to invent a new Linnaeus, wipe out the past, and begin all over again."

Odontoglossum aspidorhinum is a new species described by Mr. F. C. Lehmann, of Popayan, in *The Gardeners' Chronicle* as remarkably floriferous. He says, "not only does every pseudo-bulb produce two flower-spikes at one time, but they do so for two, and even three, years in succession." He has seen small plants bearing from twenty to thirty flower-spikes, forming a semiglobular flowering mass of great beauty. The pseudo-bulbs are two inches long; the leaves are narrow and six inches long, and the flower-spikes are from twelve to eighteen inches high, each bearing from nine to fifteen flowers, which are about an inch and a half across; the sepals and petals small and yellow; the lip panduriform, fringed and pointed, white, spotted with lilac-crimson. It is a native of Colombia, where it grows at a high elevation on trees on the eastern declivities of the western Andes of the Cauca.

Messrs. Low & Co., of Clapton, have lately flowered plants of a *Dendrobium* imported by them from north Borneo, and which was submitted to Kew for name. Mr. Rolfe has described it as a new species, and he has given it the very appropriate name of *Sanguineum* in allusion to the crimson color of its flowers, in which respect it is unique in the genus. *D. sanguineum* is allied to *D. crumenatum*, and has slender stems about a yard long, swollen at the base; the leaves are linear oblong, and the flowers, which are axillary and solitary, are an inch long, with obovate crimson petals and sepals, the lip being small, wavy, white, with purple lines and spots. Mr. Rolfe thinks that if the plant proves easy to cultivate and flower it will find favor as a garden Orchid. No doubt, the hybridizer will be interested in it in any case.

London.

W. Watson.

New or Little-known Plants.

Yucca Whipplei.

IN spring and early summer the dry hillsides of south-western California are made glorious with the tall, narrow, stout-stemmed panicles of this plant, which often rise to the height of ten or fifteen feet above the rosettes of its narrow pale-green leaves. The habit and general appearance of this *Yucca*, when it is in flower, is shown in the illustration on page 415 of this issue, made from a photograph taken in the neighborhood of Pasadena, where *Yucca Whipplei* is exceedingly abundant on the low foot-hills of the mountains. Less imposing in habit, of course, than the arborescent species which are so common on the deserts of the south-west, *Yucca Whipplei* surpasses all the known *Yuccas* in the height and beauty of its panicle of flowers. To the botanist, too, it is a plant of peculiar interest as the only representative of a section of the genus (*Hesperoyucca*) distinguished by the rotate and spreading perianth, the small acute filaments, didymous transverse anthers and peltate, stalked stigma of the flower, the three-valved capsular fruit and thin seeds.

The Witch-hazel in full flower, while its yellow leaves are falling in October, reminds me of the earliest spring. Its blossoms smell like Willow catkins, and in color and fragrance they belong to the saffron dawn of the year, suggesting amid falling leaves and frost that the eternal life of nature is untouched and all the year is spring.—Thoreau.

Plant Notes.

PSEUDOLARIX KÆMPFERI.—This is a tree which might safely be planted in the northern states much more often than it is. It is the only representative of a very peculiar genus, with the habit of a Cedar, the foliage of a Larch and the cones of a Fir. It is well called the Golden Larch, for it looks to the unsophisticated observer more like a Larch

branches for fifty feet above the ground. The original home, however, of the Golden Larch was probably in some colder region, for it flourishes in New England, where it is not affected by the hottest or driest summers or the coldest winters. It is as hardy as the Ginkgo, and, curiously, like the Ginkgo, it is known only as a cultivated tree, and, so far as we have been able to learn, no American or European has ever seen these two remarkable monotypic deciduous-leaved conifers growing beyond the limits of cultivated grounds. The name of the remote mountain valley of western China, Mongolia or Thibet, from which the priests of Buddha brought these two trees to enoble their temple gardens, is a secret that has been well guarded. A region which can produce such trees can, perhaps, produce other valuable plants, and its discovery and exploration is well worth the efforts of the enterprising and ambitious collector of plants. *Pseudolarix Kæmpferi*, which appears to grow more satisfactorily in our northern states than in Europe, has remained a rare tree, as it has proved difficult to propagate by grafts, and until recently seeds have been scarce. Of late years, however, a tree in the nursery of Rovelli Frères, at Palanza, on the shores of Lake Majiore, has produced good crops of seeds; and the specimen in Mr. Hunnewell's Pinetum at Wellesley, Massachusetts, two years ago began to bear fertile cones, from which seedlings have already been raised. It may be expected, therefore, that this noble and beautiful tree may soon become common enough to be within reach of every one who wants to plant it. The largest specimen in the United States is growing on the grounds of the old Parsons' Nursery at Flushing, Long Island. This tree was bought in London at an auction of plants offered by Fortune in 1859, and it was then three feet high. It is now a broad-branched, handsome specimen about fifty-five feet high, with a trunk diameter of two feet, and its branches cover an area fifty feet across. This tree has also borne seeds.

CIRRUS TRIFOLIATA.—This shrub or small tree is reliably hardy as far north as Philadelphia, where it sets and ripens fruit with tolerable regularity, and there are a number of good specimens near this city, one of them in Central Park, but, so far as we know, they bear no fruit. Mr. Oliver writes that on the grounds of the Department of Agriculture at Washington this year the bushes are loaded with the small yellow oranges, and make a very showy appearance. These have been planted in their present quarters some twelve or fifteen years, and they average about fifteen feet in height. As they get older they produce fruit in greater profusion. The flowers appear very early in the season; so early, in fact, that they are sometimes nipped by late frosts. This Citrus, in a few years after planting, forms an almost impene-

trable hedge, as it bears pruning wonderfully well. Each fruit contains a number of seeds, which, if sown as soon as gathered, will make plants ready for setting out within a year.

HYPERICUM ADPRESSUM.—This herb, with slender rigid stems, slightly woody at the base and about a foot tall, spreads rapidly by underground stolons; and a bit of the



No. 56.—*Yucca Whipplei* in Southern California.—See page 414.

than any other tree, and in the autumn the leaves turn a beautiful golden color before falling. This tree was first made known to Europeans by Robert Fortune, who found it in the gardens of a Buddhist monastery in the western part of the Chinese province of Chkiang, where there were trees from one hundred and twenty to one hundred and thirty feet tall, with trunks two feet in diameter, free of

root planted in good soil will become at the end of a couple of years a dense mat four or five feet across. It has lanceolate bright green leaves and terminal few flowered cymes of small bright yellow flowers. It grows in rather moist soil, and is distributed from the island of Nantucket, off the coast of southern Massachusetts, and Rhode Island southward. Its compact habit, low stature and ability to spread rapidly, suggest that this pretty little *Hypericum* may be a good plant to cover the ground of shrub-beds. The number of plants that we can use at the north for this purpose is not large, and the discovery of additions to the number is desirable. The best covering plant, of course, is the Periwinkle, but it takes some time to form a mat that weeds cannot grow through. The Periwinkle being an evergreen, a bed covered with it catches falling leaves in the autumn and holds them all winter, and the cleaning of such a bed in the spring is a slow and expensive operation. The Japanese Honeysuckle makes a good carpet, as it grows rapidly and covers the ground in one season, but it has the disadvantage of being so rampant that it grows into and over the shrubs above it unless the stems are cut over every year. This is the trouble, too, with the Japanese *Rosa Wichuraiana* when used in this way. It soon clothes the ground with a beautiful green carpet, but its long vigorous stems, which often grow twenty feet in a season, soon smother every plant that comes in contact with them. Some of our dwarf native Roses would be good plants for this purpose, but they usually grow too tall and consume too much plant-food; and what is really needed is a deciduous-leaved shrub which will spread rapidly by underground stolons into dense mats and will not, under the most favorable conditions, grow more than eight or ten inches high. *Hypericum adpressum* comes nearer to filling these requirements than any other perfectly hardy plant we have seen recently.

AGLAONEMA PICTUM.—This is a fine foliage-plant of the Arum family with curiously mottled leaves. It is very dwarf in habit, growing to a height of eight or ten inches. If the shoots are topped the plant will form compact masses of very handsome foliage. The leaves are about six inches long, ovate-lanceolate, with cordate base and rather long petioles. The color is a deep velvety green, with silvery gray, well-marked spots and blotches chiefly along the midrib, and in a lesser degree over the whole surface of the blade. The plant flowers freely, and will fruit if fertilized artificially. The spathe is about an inch long, spoon-like, of a creamy white color, but inconspicuous; the spadix short, club-like, greenish. For house-culture this is likely to become a very satisfactory plant, and it is pretty for any indoor decoration. Planted in pans so as to form dense masses of foliage, and with the ground covered with some creeping species of Club-moss—for instance, *Selaginella denticulata* or *S. cassia*—it forms a tasteful ornament for a dinner-table. Light vegetable soil is the best, and it is readily propagated by cuttings.

Cultural Department.

Oncoclylus Irises.

NOT many hardy plants have been more disappointing in gardens than the *Oncoclylus* Irises. A few gardeners, happily situated, or by dint of careful management, occasionally flower them, apparently, however, not for a long succession of years. Many of my flower-loving friends report failures most discouraging. The failures are especially aggravating, as the rhizomes are perfectly hardy, and many spines with most beautiful flowers are now available. It is rather humiliating to be nonplussed and thwarted by a plant which is perfectly ready to grow and do its part if the gardener supplies the proper environment. Among several reasons for lack of success with these plants the principal one is probably that good strong rhizomes have not been planted. Such rhizomes are very scarce; in fact, rare, and can seldom be secured from either dealers or collectors. Judging from the somewhat numerous pieces of collected plants which have reached here the rhizomes are seldom vigorous in a wild state. As they

improve under cultivation there is a possible question whether the drought, to which they are accustomed, is entirely beneficial. Apparently the first requisite to the successful cultivation of these *O. Irises* is to work up a stock of strong, vigorous roots from the dormant weak pieces usually received. If these are planted when received, before the ground is cold, they will make a weakly growth of leaves, to be ruined by winter storms. As they will not have made strong roots, and have little reserve force in the rhizomes, they will not recuperate, and if dried off at the usual time will often disappear. After many such failures I have been convinced that the procedure was wrong. Lately I have found that by keeping the rhizomes dormant, and planting them out very late—early in December—they remain dormant and appear in the early spring after frosts are finished. Hence they grow on without interruption or weakening, and make strong roots, and with a stock of these future operations are simple. Prudent cultivators, having secured strong plants, will do well to follow the teaching of Herr Max Leichtlin, who advises covering them overhead in June with a sash, which is to be removed in August or September, thus giving them a forced rest. In this climate I am inclined to think that if they are allowed to grow somewhat longer and can be checked somewhat later, so that they will have made little or no foliage-growth before winter, successful flowering will be more certain. This will allow the rhizomes to gain strength after flowering, and later the foliage, not being advanced, will be less liable to injury. Any one who flowers a collection of *Oncoclylus* Irises in the open successfully for a succession of years will have an interesting experience and have reason to feel much pride in his skill as a cultivator.

Elizabeth, N. J.

J. N. Gerard.

The Vegetable Garden.

KILLING frosts have now destroyed all tender crops in this section, and the vegetable garden begins to look bare. Plants of Sweet Corn, Beans, Tomatoes, Melons, Cucumbers and the like we clear away to the rubbish-pile before they rot and become disagreeable to handle. We always save a quantity of corn-stalks of the taller sorts; they are useful to scatter over beds of Strawberries or half-hardy perennials after they have had a covering of dry leaves.

Early and second-early Celery of the White Plume and Self-blanching kinds, which is being blanched by means of boards, will now require some earth thrown up to the boards. A few stout sticks driven inside the boards will keep them from caving in on the plants. A quantity of dry leaves worked loosely among the plants will preserve them for some time to come; later in the season a coating of litter-manure can be given. We are just commencing to earth up our winter supply of Celery; before doing so we remove all decaying stems and tie up the plants loosely. The final earthing up is not done until November. Of course, the plants should be perfectly dry when earthed up and the soil carefully packed among them so as not to break the somewhat brittle stems. We have had so much better success with keeping Celery out in the open where it has been growing than we no longer lift and house any of the crops now. Lifted plants rot badly, the roots too often die, and the plants quickly follow. When kept outside the root-action is not checked, and if protected with a good coating of strawy manure or leaves, and boards to throw off some of the moisture, we find it keeps in good condition until spring. Of course, the ground where late Celery is grown should have a gentle slope, so that water will not stand on the ground during winter. I have seen much better heads kept in this way than by any lifting method. In this locality Boston Market and Giant Paschal are the standard winter sorts, but a second season's trial of that fine Michigan variety, Kalamazoo, has proved it to be far superior to either of these sorts. It has an erect habit, has shown no sign of disease, is of fine flavor and unexcelled as a keeper.

Parsnips, carrots, turnips and beets we keep in an open shed packed in sand and covered over with a thick coating of dry leaves. November is early enough to lift these. Parsley should now be lifted and planted in a cold frame in some well-enriched compost. We strip off all the leaves but a few of those next the crown and trim off the tap-roots. The strongest plants and those showing the best-curled leaves should be selected. By placing a few inches of dry leaves over the plants in December little further protection outside of the sash is needed during winter, an abundance of nice parsley can be had. For convenience in severe weather, a few large pots or boxes may be filled and placed in a spare corner in a cool house. Lettuces which are heading up, if lifted with a ball of

earth and planted in frames, will give useful heads until Thanksgiving. A few dry leaves over the heads in the open will protect them from all the frost we are likely to have for some time yet. Late-sown batches should now be pricked into frames prepared for them. Endive may be kept in excellent condition for some time by lifting it on a dry day and planting in a cold frame. A coating of sand over the surface will prevent the spread of mold. In Great Britain endive is kept all winter in a cool cellar by carefully packing it in sand, two or three inches of the leaves only being allowed to stand above the sand. The plants are always perfectly dry when lifted, tied up, and not allowed to touch each other in the sand. In this way they blanch better than by any other method I have seen tried.

Asparagus tops should now be cut down, all weeds cleared away and the beds slightly loosened. We give them a moderate coating of rotted manure in November, not so much for protection, but to fertilize the ground. We loosen the surface to allow the manure to leach the roots. Seaweed is one of the best of manures for Asparagus; if this cannot be had a little salt may be mixed with the manure. Plantings of Asparagus may be made either now or in spring; I prefer spring planting.

Brussels Sprouts and all members of the Brassica family will be benefited by having the decaying and lower leaves removed. From the middle to the end of November we lift these and heel them in frames or outdoors in a warm situation, covering well with dry, light protecting material. Leeks are very hardy, but are best heeled in close together; they do not decay as Celery does when lifted. Cauliflower may be partially protected by breaking down the centre leaves over the flower; those not fully headed up should be heeled in a cold frame early in November.

Early Tomatoes sown in July now have fruit of good size, and these will commence to ripen toward the end of the month. Our second batch has just been given a shift into fruiting pots. When the pots are well filled with roots liberal supplies of stimulants should be given. From November to the end of February artificial pollination is necessary to secure a fine crop; this is best done about noon on a bright, clear day. Now is a good time to make an additional sowing to yield ripe fruit about the end of March. May's Favorite is the most satisfactory sort we have grown for spring fruiting.

Manuring and deep digging or trenching unused ground may now be attended to. If cut-worms and wire-worms have been troublesome a good coating of lime can be given; and the lime will be useful to the sod also whenever it is of a heavy, clayey nature. We prefer to do as much work of this sort as possible before severe frosts, so as to relieve the pressure of work in the busy spring season.

W. N. Craig.

Indoor Work.

THE housing of the tender plants that have been in use in the garden during the summer will now be nearly or quite completed, but after these plants are safely under cover it becomes an interesting question to many a grower with but a small area of glass at his disposal how to arrange for this sudden influx of plants without interfering with those already in the houses. It is at such a time that the value of a well-built and slightly heated pit or deep frame becomes apparent, and more than pays for the slight cost of its construction.

Besides this plan for economizing space some private greenhouses here, and some commercial establishments in Europe, have shelves of heavy glass suspended from the roof by brackets or chains, a much more neat device and much less obstructive to light than wooden shelves. Shelves of this kind are very useful for many light-loving plants, and induce a short and stocky habit.

Among the lifted plants the Cannas are important, and some of them should be divided up into convenient sizes, potted in rich loam and grown on for conservatory decoration during the winter and spring. Particularly large and brilliant flowers may be had under glass, and the whole spike of flowers and foliage together can be put to good use in filling a large vase with cut flowers for a church or hall decoration.

The various bulbs for winter and spring forcing should be potted at once. Continued exposure to the air is injurious to them, and particularly so to the bulbs of various Lilies, which lose much of their vitality when long exposed.

Calla Lilies are indispensables in most conservatories, and it is well to know that the California-grown bulbs are now offered so cheaply and of such good quality that it is hardly worth while to keep old bulbs over from year to year, as the fresh bulbs will probably yield more flowers.

A few specimens, at least, of the brilliant-hued Poinsettias

should be found in every greenhouse where a temperature of sixty degrees can be maintained. Poinsettias are quite susceptible to draughts and sudden changes of temperature; though they do not require extreme heat they should have full light and generous treatment as to soil and moisture. Euphorbia Jaquinæflora, another admirable plant for winter flowers, needs like treatment. Some plants of Begonia incarnata and B. Gloire de Sceaux should now be in their blooming pots, and will need plenty of water and some weak liquid-manure at intervals. Cyclamens will also be rapidly coming into flower, and tobacco stems chopped into short lengths should be spread among the pots as a safeguard against aphides. Chrysanthemums and Cinerarias need similar applications of tobacco against the insects, which are the most dangerous enemies to the flowers and foliage of both these plants.

Roses for winter flowering, if well established, can now be allowed to flower, and if on side benches will need some tying to keep the shoots away from the glass. If specially large flowers are desired on the Carnations, some disbudding must be done, but those used as pot-plants in the conservatory should not be disbudded, as in this case quantity of bloom is more important than the size of the flowers. Most foliage plants are not potted until spring, but they must be kept scrupulously clean, for with the additional fire-heat comes a fresh outbreak of insects, and scale and mealy-bug multiply a hundred-fold, in an incredibly short time.

Of course, a good supply of potting material should be put under cover for the winter, and any delayed repairs, like glazing, painting or alterations to boilers or pipes, must be attended to at once.

Holmesburg, Pa.

W. H. Taplin.

Polyscias paniculata.—This plant, more commonly known as Terminalia elegans, is useful both for the conservatory in winter and for planting out in summer, since it will color beautifully out-of-doors. The leaves are pinnate, having from five to nine leaflets, the terminal one being about six inches in length. There is little danger that it will ever become common, as the shoots branch very little and there is a difficulty in rooting cuttings, except those made from the tips of the shoots.

Tricyrtis hi:ta.—The Japanese Toad Lily is among the latest of herbaceous plants to come into bloom. The flowers are not showy, but there is a certain individuality and quaintness about the plant which have won for it many admirers. During the summer months while making its growth the plant has rather an ornamental appearance, the pretty shaped leaves being arranged alternately on upright stalks. The curiously shaped purple-spotted flowers are produced in the axils of the upper leaves. This species will not stand a protracted drought, for, without a good supply of moisture, the leaves lose their beauty, and the flowers, even when they appear at all, are very small.

Cornell University, Washington, D. C.

G. W. Oliver.

Frost Injuries to Pears and Apples.—It is not uncommon to see pears and apples surrounded by a narrow russet zone. In pears this zone is nearly always at the apex, while in the apple it may be situated at the apex or between the apex and stem. This belt is due to an injury to the epidermis of the fruit in its young stage, and is caused by the freezing of dew collected on these spaces. The fruit at this time is upright, and the place where the dew collects is probably determined by the formation and position of the fruit. It is interesting to note that the cells in the frosted zones multiply and produce cells of their own kind, thus increasing the width of the zone during the growing period. The reason for this is not yet known.

Cornell University.

G. Harold Powell.

Correspondence.

Seasonable Notes from Wellesley, Massachusetts.

To the Editor of GARDEN AND FOREST:

Sir,—After a season's growth, or it may be a season's rest, out-of-doors, tender plants of all kinds are returned to the greenhouses, and they again resume their attractiveness. During a stroll through the greenhouses at Wellesley we find many rare and beautiful plants, and Mr. Harris, who has been Mr. Hunnewell's gardener more than forty years, is able to go back to days when horticultural operations were conducted under very different conditions from those which now prevail, and we naturally find here many old plants which carry us back to those days.

In one of the houses stands a magnificent pan of *Hippeastrum platypetalum*. It is one of the earliest and best, with

stout scapes of erect flowers of salmon-red shade. Mr. Harris does not think this species has ever been used as a parent of any of the newer hybrids, as he has never seen any like it. There are three species of Allamandas now in bloom. A. Williamsii is the most dwarf, and when grown in a pot makes an excellent bush specimen. It was so exhibited last summer by Mr. William Martin, gardener to N. T. Kidder, Esq., of Milton, Massachusetts, to whom the Massachusetts Horticultural Society awarded a silver medal. I have not seen it used as a pillar or roof plant, but, no doubt, with generous treatment, such as it would get when planted out, it would prove as effective as any of the coarser varieties, some of which are really too rampant. The flowers are trumpet-shaped, about two inches in diameter, measured across the limb of the corolla, and deep yellow in color. It blooms abundantly nearly the year round. A. cathartica, var. Hendersoni, is a much stronger grower. It is here trained as a standard, and as such is very effective. It bears the largest and handsomest blooms of all the sorts grown, measuring nearly four inches across the corolla limb. They are clear sulphur-yellow and elegantly recurved and revolute. A. Schottii is the coarsest grower of all, and similar in habit to Henderson's variety. The flowers are about the same size, though not so handsome in outline, and have a distinguishing blotch of orange-yellow at the base of the throat. There is here a large plant in the tropical house, which, if not regularly pruned, would soon take possession, to the exclusion of everything else. Ixoras, now seldom seen, are here represented by I. Williamsii and I. coccinea. To exhibit well-flowered specimens is a rare achievement, and a group of these was always a commanding feature in the old-time exhibitions. In another house there is a group of about twenty plants of the uncommon greenhouse Rhododendrons of the Javanicum-jasminiflorum type. These seem to do better when given continuous greenhouse treatment, with partial shade, as they are undoubtedly undershrubs in their native country. They need generous warmth during the winter months. Although they never make the gorgeous display which the hardy hybrids do, yet they are continuously in bloom. As the principal part of their growth is made in summer, abundance of water must be given at this time, and a lack of it would soon be apparent in a loss of leaves and stunted growth, from which the plants recover slowly. The specimens here are all in perfect health, showing that as nearly as possible their exact requirements have been secured. These greenhouse hybrids are characterized by scattered leaves and regular monotone flowers. The corolla tube is longer, the limb shorter or narrower, and the truss looser than in the hardy kinds. Monarch is clear salmon, and Favorite a beautiful cerise-pink. R. balsamineiflorum album and R. aureum mark a new departure in this group. Both have double wax-like flowers, which hang on the plants for more than a month.

Special attention is given to Dracænas and Cordylines, and one house is almost wholly devoted to them. Some of the best varieties are seedlings raised by Mr. Harris many years ago, when these beautiful plants were less plentiful than now. Dracæna Cooperi and D. magnifica were the varieties from which nearly all his bronzy leaved varieties were raised. Mrs. H. H. Hunnewell is considered the handsomest of all. The leaves are very broad, elegantly recurved and delicately tinted with red. D. monstrosa is another of great merit. Its name is intended to indicate its proportions. Mrs. R. G. Shaw, another handsome variety of robust habit, is neatly striped with red. D. porphyrophylla superba is a renamed seedling, with the varietal name added to indicate its superiority to the type. In the estimation of many this is the best of all the bronze-leaved forms. D. Baptista, D. Youngi and D. imperialis, D. Waban and D. Wellesliana, the two latter seedlings raised by Mr. Butler, gardener to Mrs. Durant at Wellesley, add variety to this section. D. Harrisii is, without doubt, the finest of the variegated green and white varieties. It is a hybrid raised here between D. terminalis and D. regina. D. Robinsoniana is a splendid variety of erect habit with striped leaves of orange, red and green. D. gloriosa resembles this in coloring, but is entirely distinct in habit, having broad recurving leaves. The true D. indivisa with a yellow midrib is very rare in cultivation. One large specimen here is very attractive, and several smaller ones are even more graceful. As a vase-plant it is unique. D. Sanderiana, an introduction of recent years, is represented by a moderate-sized plant. It is of slender habit, with scattered ovate-lanceolate, twisted and wavy, white and green striped leaves. Its habit is distinct from all other Dracænas in that it branches freely from the root-stock. Specimens made up of three or more plants in a pot are highly decorative. D. Goldieana is a very distinct species from south Africa. The broadly ovate white and green barred leaves

make small specimens of these plants among the best for table decorations. Two species in Mr. Butler's greenhouse are especially worthy of note. These are D. spectabilis, a clear green-leaved variety resembling some of the Terminalis group; the leaves are broadly lanceolate, the habit is excellent, and it should be most useful for grouping. D. umbraculifera is an uncommonly handsome species with leaves more than four feet long; it resembles somewhat the D. indivisa type, but the leaves recurve, umbrella-fashion.

Wellesley, Mass.

T. D. Hatfield.

A Few Climbing Plants.

To the Editor of GARDEN AND FOREST:

Sir,—Among the useful climbers which I lately saw flowering out-of-doors in the Botanic Gardens here were three Ipomœas. I. rubro-cœrulea daily displayed hundreds of flowers. On some mornings they are all, or nearly all, of that deep color which has been commonly described as heavenly blue. At other times the blue is dashed, blotched or merely touched with an exquisite shade of rose, and occasionally it shows a flower of this color with scarcely a hint of blue. I. setosa is a vigorous grower, with every stem clothed with a close growth of reddish hairs. I. paniculata is another decorative species of rapid growth, with distinct, palmately divided leaves, and while its flowers are of a color disliked by some, this defect is less noticeable at the distance from which the plant is seen to best advantage. For outlining the pillars and eaves of porches this Ipomœa is admirable. It never forms the heavy, shapeless masses of foliage that I. noctiflora, the Moon Flower, always develops before the season is ended.

Luffa cylindrica, commonly known as the Dishcloth Gourd, would be out of place where the Ipomœas look best, but it is, nevertheless, a useful and handsome plant. Clambering over a garden-fence, or in some similar situation, it has an air of elegance that makes it too good to be slighted, and its clusters of golden-yellow flowers are in form much like those of the aristocratic Allamanda nerifolia, but their color, though good in itself, is crude in comparison with the soft, pure yellow of the exquisitely textured Allamanda blossoms.

Several varieties of Aristolochia flower here luxuriantly when planted out-of-doors. A. elegans deserves its name. Its handsome, broad, chocolate and creamy flesh-colored flowers are freely produced, and have none of the disagreeable odor that characterizes those of most Aristolochias. A very unusual floral spectacle was furnished by a hedge a hundred feet long of A. cymbifera in full flower. The plants, from cuttings started in early spring, are trained on two wires stretched at one and four feet, respectively, above the ground, and the entire hedge is a series of festoons of fantastic flowers which have an odor that can only be described as offensive.

A stone wall that serves as the barrier between the garden and the street is lined for a space with old plants of the Japanese Trumpet Creeper, Tecoma grandiflora, and the brilliant masses of their flame-colored flowers make one marvel why this plant is seen so rarely as compared with our own Trumpet-vine.

Brighton, Ill.

Fanny Copley Seavey.

Meetings of Societies.

The American Dahlia Society.

THE first annual meeting of this society was held on Wednesday last in Philadelphia, at the rooms of A. Blanc. This society was organized last spring by a few persons residing in the neighborhood of Philadelphia, for the purpose of popularizing the Dahlia, and of collecting and comparing information concerning the plant. Meetings have been held from time to time of those who chanced to be drawn together by common interest, but this is the first stated and regular meeting of the society. Early in the season it was intended that a large exhibition should be held this fall, and it was hoped that it might rival the Chrysanthemum shows in general interest; but the unprecedented drought in the neighborhood of Philadelphia has made such an exhibition impossible. So a few persons came together for the purpose of transacting some necessary business and to keep the society moving until it shall have the opportunity to make itself felt by a worthy display of flowers and plants. About a hundred and fifty varieties of Dahlias were on exhibition, however, having been brought in by growers for purposes of comparison. Many of them were unnamed seedlings. The largest lot, comprising 101 varieties, was brought in by the Secretary, Lawrence Peacock, Atco, New Jersey. Other exhibitors were A. Blanc, Philadelphia;

Albert Knapper, Frankford, Pennsylvania ; C. B. Taylor, Germantown ; Rev. C. W. Bolton, Pelhamville, New York.

One who studied these Dahlias would discern four general types or classes—the old ball-flowered type, the so-called Cactus type, the Pompons and the single-flowered sorts. The most decorative and artistic of these are the Cactus-flowered and single types, and the former are now popular with all growers, although it is said that flower buyers still prefer the formal ball-like varieties. The Cactus Dahlias bear a strong resemblance to the more formal Chrysanthemums, and when they are better known they may be expected to share some of the praise which the Chrysanthemum receives. This type originated from the famous Dahlia Juarezii, although that old form would not now be considered the typical one for a Cactus Dahlia. Tastes have changed since its advent, and breeders of Dahlias have made marked departures from the original. The Cactus Dahlia of a few years ago was characterized by an open, rather loose flower, in which the florets were of unequal lengths and overlapping, and the corollas flattened out at their extremities, instead of being tubular or funnel-form, as in the older types. These features are still retained in the main, but the florets must now be longer, with revolute margins or tips and a tendency to twist. In other words, the Dahlia is undergoing an evolution toward freedom and oddity of outline similar to that which has characterized the recent history of the Chrysanthemum.

The Pompon Dahlias are simply miniatures of the old ball-shaped types, but their earliness and freedom of bloom will certainly make them favorites. To many persons the single Dahlias are the most satisfactory of all the varieties, but they find only a limited sale in the general market. A true single Dahlia, as understood in England, should have but eight rays, but most of those which one sees at exhibitions in this country have more than that number.

Most of the Dahlias now raised in this country by the large growers are used for stock, that is, to produce salable bulbs, but the time is surely coming when the Dahlia will have a place of importance in the cut-flower trade and for decorative gardening. The varieties may be cast into three sections in respect to the size of the plants—the dwarfs, eighteen inches or less high; the half-dwarfs, two and a half feet high or less, and the standards or tall kinds, some of the last sometimes reaching a height of twelve or fifteen feet. A fourth class might be made, comprising the Tom Thumbs, which grow twelve inches or less high. The tall kinds are generally most useful for cut flowers, because the stems are very long, while some of the dwarfs are excellent for bedding, and the short-stemmed flowers are useful in the making of floral pieces. The half-dwarfs—a race which is receiving much attention at Mr. Peacock's place—afford some varieties which give excellent stems for cutting, and they are also useful in high bedding and for borders. During the summer and autumn Mr. Peacock has sold cut dahlias for a higher price than that ruling for roses. They often retail for as much as one dollar a dozen. Better results in cut flowers are to be had if the plants are given ample room—at least two by four feet. At this distance they also stand the dry weather better.

Among the varieties on exhibition, the following may be mentioned: Nymphæa, a very fine Cactus Dahlia, originating in Salem County, New Jersey, from seed of Mrs. Hawkins, and now very popular for cutting—very delicate pink, full double, rather large, resembling a Water-lily in form; Mrs. Hawkins, like Nymphæa in shape and size, but with a light yellow centre and pink border; Miss Penne Baker, a novelty of Mr. Peacock's, rose-pink, with flesh centre, ball-shaped, very delicate and handsome; Madame Moreau, a very large pink-red, ball-shaped Dahlia of most regular size, and one of the best for cut flowers; Pluton, perhaps the best clear self-yellow globular Dahlia, excellent for cutting; Penelope, good for cutting, ball type, white, tipped lavender, excellent. Among the Pompons, the leading ones were Klein Domatia, a very free bloomer, pale salmon; Fairy Tales, pale primrose, very free bloomer, probably the earliest variety; Aillet's Imperial, pinkish white, tipped with deep pink purple; Sprig, one of Peacock's, rich buff, tipped deep pink; Little Prince, very early, tall, the flowers of perfect shape, but variable in color; Alba imbricata, one of the best of this class, white, free bloomer. Of the large-flowered dwarfs suitable for bedding, Souvenir de Solferino attracted attention. It reaches a height of only eighteen or twenty inches, and covers itself with great dark red flowers. Other good varieties for cut flowers are Lucy Fawcett, straw-colored, striped light red; Princesse Bonne, clear yellow, tipped creamy white; Keystone, variegated; Mrs. Langtry, yellow, and tipped pink in the centre, outer florets darker.

The interest in Dahlias in this country is very small. This

arises partly from the fact that no firm has systematically pushed the newer varieties, some of which possess uncommon attractiveness. A generation and more ago the Dahlia was one of the best-known and most-prized of all garden-plants, and in the rural districts in New York and Pennsylvania one may still trace the effects of this early popularity in the general interest which country folk take in the plant. But these varieties which one sees in old yards are mostly of one type, although they may vary widely in color. They represent the old ball-shaped Dahlias, with perfectly regular and funnel-like florets. There is no more striking example of the tendency of modern taste toward freedom and irregularity of outline than is seen in the Dahlia, and this is one of the very points which this new society can present to the public. The Dahlia will always remain a favorite flower with those persons who like to grow their own plants, because it can be had in perfection without artificial heat, and the season of bloom may easily be extended from June until frost. The named varieties are numerous and of many diverse kinds. The plant, therefore, is one which is worthy of more general attention in this country.

Something like 2,000 named varieties of Dahlias are now known in Europe, where the plant is much prized. In this country the largest single collection is probably that of Lawrence Peacock, who has about 600 varieties this year. A. Blanc has six acres of Dahlias this year, comprising some hundreds of varieties. Other important growers are William Bassett & Son, Hammonton, New Jersey, and W. Wilmore, Denver, Colorado. Within a year or two, however, there will undoubtedly be many large growers interested in the Dahlia, for it is rapidly emerging from its long obscurity.

Cornell University.

L. H. Bailey.

Recent Publications.

Game Birds at Home. By Theodore S. Van Dyke. New York : Fords, Howard & Hulbert.

One may feel inclined to question the accuracy of Mr. Van Dyke's statement in his preface to this pleasant little book that to the majority of sportsmen the love of nature is the principal element in the love of hunting. There can be no doubt, however, that many readers who do not aspire to be called sportsmen will find the easy, unaffected descriptions of the homes of the game birds—that is, the natural scenery through which the sportsman wanders—the most alluring feature of the book. One who reads these descriptions of the haunts of a dozen of our game birds is led among timbered hills, through the tall grasses of endless prairies, the grim Cactus-fields of the west, the Manzanita thickets of California, the southern river-bottoms fragrant with purpling Fox Grapes, the seashores and inland lakes and sloughs frequented by the water-birds. There is no attempt at fine writing; none of those melancholy and painfully wrought word-pictures of scenes that never existed; but, in their stead, suggestive and illuminating phrases dropped here and there which kindle the imagination, so that the reader cannot help filling out the picture from the stores of his own experience, enabling him to see over again in the mellow light of memory scenes that have left their impressions on his mind, and which he is only too happy to recall. As we read of hoarfrosts sparkling on buckwheat stubble, all the pomp and pathos of an American autumn passes at once before our eyes. The gleaming of Blood-root blossoms above sodden leaves, the wavering checkers of light upon the forest floor, the brook which gleams through groves of Wild Plum, Crab Apple and Hawthorn, orchard-like groups of Bur Oaks on prairie swells, the ghostly arms of dead Cottonwoods on the banks of broad rivers—touches like these all genuine, all typical of scenes or seasons, revivify old impressions of outdoor beauty and outdoor life that we have at some time enjoyed. Of course, all this is but an atmosphere, and yet it lends charm to the story of the birds, and makes more vivid and real the fascinating accounts of their appearance and behavior, which is evidently Mr. Van Dyke's chief joy as a sportsman. No doubt, the expert hunter may find here hints to help him in his pursuit of game, but the author need not have told us that, although the book was written for sportsmen, it was

written rather to touch certain tender chords of memory than to convey information. Nor was there any need for Mr. Van Dyke to have stated that he was no murderer. No thirst for blood is manifested in all these pages, and there is nothing among all the accounts of successful shooting to cause indignation or pity, but only admiration for the skill of the man and the intelligence of the dog, which combine to make a prosperous day's sport. Altogether, this is a book to be thoroughly enjoyed by all who take a wholesome delight in the country and in its wary inhabitants whose capture requires the exercise of so much intelligence and skill.

Notes.

A neat little booklet on the care of house-plants has been issued, for the use of their customers, by Bertermann Brothers, florists, of Indianapolis, Indiana.

One of the prominent pomologists of Russia, Mr. Jaroslav Niemetz, has been sent by the Government of his country to make a tour of the United States and Canada in the interests of Russian pomology. In his large experimental orchard at Roveno Mr. Niemetz has under trial twelve hundred varieties of Apples alone, and of other fruits in proportion.

Mr. Joseph Meehan considers *Cypripedium insigne* one of the best winter-blooming window-plants. This Lady's-slipper will thrive in a five or six inch pot with ordinary care, and from its clusters of bright green leaves flower-stems will rise and bear from three to six flowers, which will last in good condition from six weeks to two months. When not forced, as in a cool window, the flowers will open at Christmas and they will be in good condition in March.

In the Horticultural Department of Cornell University, in addition to the courses formerly given, among the new subjects to be taken up next year are: (1) the literature of horticulture, including what has been written of plants in cultivation in all parts of the world, with reviews of periodical literature; (2) greenhouse management and construction; (3) floriculture; (4) the botany of cultivated plants; (5) theory and practice of spraying plants. These courses, in connection with those of pomology, landscape-gardening, the propagation of plants and handicraft, will make the horticultural course in Cornell very complete and attractive.

Vegetables from the south are already in our markets, to follow the latest which escaped frost in the north. Peas are coming from Charleston and sell for sixty cents a half-peck. String beans, from the same section, cost as much, and new southern okra is selling for ten cents a dozen. Celery, which is now coming from the south and west, as also from near-by points, has been scarce, owing to deferred shipments, while growers are busy storing the crop for winter; one dozen stalks cost seventy-five cents. Field mushrooms, the first seen here this autumn, cost but fifty cents a pound, although their natural flavor is preferred by many to that of the cultivated product; the cultivated ones, which are of even size and more inviting color, cost \$1.00 a pound. Egg-plants still come from New Jersey, and sugar corn, Lima beans and peppers from Long Island. Vegetable marrows cost ten to fifteen cents apiece. Besides escarole, chicory, Romaine and other lettuces, spinach, mint, water-cress, chervil, tarragon and chives are the greens most in demand.

A correspondent inquires how to suppress the Wild Carrot. This is certainly a pestilent weed, but it is rarely troublesome in cultivated fields, and this shows that it can be kept down by moderate cultivation, and if the weed is destroyed in waste places it will soon be comparatively harmless. If the plants are mowed off as often as the flowers appear they will eventually be destroyed, although they will continue to throw out stems from the bottom after each cutting, so that at first they will appear to increase rather than diminish. Sheep will eat the young plants, and they can be pulled out by hand when the ground is wet, which is a laborious, but sure, means of extirpation. If the root is cut off with a spud some distance below the surface of the ground the plant will usually die. A detailed account of this and many other of our aggressive weeds will be found in Farmers' Bulletin, No. 28, published by the United States Department of Agriculture, with the best means of exterminating the individuals and different classes of weeds.

The careful protection of Blackberries, Raspberries and other small-fruit plants in the winter is an essential of the highest success throughout the northern states. Even where the plants are not killed, their vitality is often so weakened by

the cold that only a fraction of a crop can be expected. This is particularly true of the best varieties, which are more often grown under high cultivation, and, therefore, make a large and comparatively tender growth. The best method of protection is to lay down the canes and cover the tips with earth. *The Western Farmer* gives these directions for treating the plants in more northern latitudes. Where the rows are set north and south, begin at the northern end, remove the earth from the north side of the first hill to a depth of four inches; gather the branches closely with a wide fork, raising it toward the top of the bush, press it gently to the north and set the foot firmly on the base of the plant, bearing hard in the same direction. Where the bushes are old or the ground is hard, it is best to have a second man, who inserts a potato-fork deeply on the south side of the hill, pressing it over gently until the bush is nearly flat on the ground. It should then be held down with a fork until it is properly covered, and the top of the next hill should rest near the base of the first, and so on, making a continuous cover in the line of the row.

A late report from the United States Consul at Rheims gives an account of some experiments for keeping fruit fresh, which have been made by A. Petit, Chief of the Laboratory of Research in the Horticultural School at Versailles. Having observed the action of alcoholic vapors on the mold which appears on the surface of fruit in damp air, Mr. Petit, on the 31st of October, placed fresh grapes in a brick vault, cemented on the inside and closed as nearly hermetically as possible with a common wooden door. Among the fruits he had placed an open bottle of alcohol of about sixty cubic inches' capacity. On November 20th, grapes which had been placed in two other vaults, one of which was shut up without alcohol, while the other was open, were mostly rotted and covered with mold. In the one containing the alcohol the grapes were plump and fair. On the 7th of December these continued in good condition, although a few had turned brown, and at the end of nearly two months the bunches had lost only from two to four grapes each, while the rest were in a perfect state of preservation, the stalks being perfectly green, the berries full, firm and savory, having all the qualities of fresh-cut grapes. Experiments with this cheap and easy device are now in progress under direction of the Division of Pomology at Washington, but so far the effects of the treatment are not as good as they are said to have been in France. The fruits do not show any mold, it is true, but in many cases they are strongly impregnated with alcohol, and their value is thereby lessened. It seems, therefore, that further tests should be made before we can consider the vapor of alcohol as an ideal fruit preservative.

The first Almeria grapes of the season arrived last week, and 1,542 barrels were sold at the wholesale auction on Thursday. Prices ranged from \$3.00 to \$6.50 a barrel, the average for the entire sale being \$4.65. This sale is ten days earlier than the first offering of last year. The fruit was not of the best quality, though the prices were high. It is estimated that 90,000 barrels will constitute the total shipments to the United States this year, against 125,000 barrels last season. The only oranges now to be had, excepting a few from Sicily, are those from Jamaica, and the fruit is of fair quality, considering its earliness. Several car-loads of Albemarle Pippins from Virginia have already been shipped from this port to England. Other American apples now in European markets are Baldwins, Greenings, Kings, Northern Spies and Ben Davis, the highest grades selling there for \$3.00 to \$6.00 a barrel. Although 17,845 barrels of cranberries have thus far reached this city, besides 3,082 crates, twice as many as were received up to the same time last year, the demand for this fruit has been active enough to force high prices. The excessive heat during September is said to have injured the Cape Cod crop, and frosts have more recently damaged the New Jersey cranberry-bogs, so that it is estimated that the total yield will not more than equal the short crop of last season. Extra-large varieties from Cape Cod command \$8.00 a barrel. The season for California fruits is drawing to a close. The last plums, prunes and peaches have been received. Pears are scarce, and will continue to be so during the winter, since much of this fruit has been forwarded to England. One hundred car-loads of California fruits have crossed the ocean during the summer and autumn, and Clairgeau, Duchesse, Easter Beurre, Comice and Glout Morceau pears now command \$3.50 to \$5.00 a box at wholesale in Great Britain; prices for the same sorts here range from \$1.85 to \$3.20 a box. Grapes constituted the bulk of thirty-seven car-loads of western fruits sold in this city last week. Chestnuts, which early in the week sold for \$7.50 to \$8.00 a barrel, fell to \$4.00 by Saturday, and hickory-nuts were plentiful at seventy-five cents and \$1.00 a barrel.

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLE: —The Year-book of the Department of Agriculture.....	421
A Season with the Native Orchids.—II.....	Rev. E. J. Hill. 422
Notes on some Arborescent Willows of North America.—III. (With figures.).....	M. S. Babb. 423
PLANT NOTES.	423
CULTURAL DEPARTMENT: —Lilies.....	E. O. Orpet. 426
Carnations and Chrysanthemums.....	T. D. Hatfield. 427
Notes on Apples.....	Professor S. A. Beach. 428
California Irises.....	J. N. G. 428
Aglaonema commutatum.....	N. J. R. 428
CORRESPONDENCE: —Garden Notes from Southern California.....	C. R. Orcutt. 428
Bulletins and the Experiment Stations.....	S. R. 429
How to Exterminate Cat-tails.....	T. 429
Railway-station Gardens.....	E. H. B. 429
RECENT PUBLICATIONS	429
NOTES	429
ILLUSTRATIONS: — <i>Salix alba</i> × <i>lucida</i> , Fig. 57.....	424
<i>Salix nigra</i> × <i>alba</i> , Fig. 58.....	425

The Year-book of the Department of Agriculture.

THIS is the first of a new series of agricultural publications to be issued under the act of January 12th, 1895. What was formerly called the annual agricultural report, and distributed by Congressmen, consisted of the administrative report of the Secretary of Agriculture, together with those of the chiefs of the bureaus and divisions in his department, and to these were added some detailed accounts of the investigations conducted by members of the scientific staff. Since the details of the executive business at Washington have little permanent value, the new act directed that the scientific monographs designed for the instruction of the people should be separated from the business matter and published in this Year-book for the improvement and education of farmers and other readers. Assistant Secretary Dabney, who has compiled this volume, says in its preface that it represents only imperfectly the ideal of what such a book should be. The law under which it has been prepared was not enacted until after the usual time for filing the report under the old rule, and many of the papers had been prepared and submitted in the usual form. Under the circumstances the only thing to be done was to select from the matter in hand the most deserving papers which represent a variety of work in different lines carried on by the various divisions of the department, and to adapt them to the purposes of the new publication. It would, therefore, be unfair to criticise the book for any shortcomings, and, indeed, it may be said that, considering the limited opportunities for making such a compilation, it is a most creditable performance. The book contains the report of the Secretary of Agriculture for 1894, which would have been better if Mr. Morton had been able to restrain himself from making political speeches whenever he has an opportunity. The second part, or the great bulk of the book, consists of a series of papers which have been prepared generally by chiefs of bureaus and their assistants, and these are discussions on a wide range of subjects related more or less closely to agricultural and horticultural practice. All of these have genuine value, and they represent the results of the latest research by men of recognized scientific standing. The book concludes with a brief series of useful reference tables

on such subjects as the composition of foods for man and of feeding stuffs for animals, the fertilizing value of different foods and the methods for suppressing insects and fungus diseases and weeds.

The view we have always taken is that the legitimate way for the Government to aid agriculture is not by disseminating seeds or by actual help in stamping out plant diseases or suppressing insects or by helping to introduce new economic plants or improved fruits, but rather to increase the efficiency of the farmer by augmenting his knowledge. But the Government must at first acquire knowledge in order to disseminate it, and to this end expert talent of the first order is needed not only at the head of each division of the department, but of all the experiment stations, which are now vitally connected with the department. These are the men we must trust to make the experiments which farmers cannot make for themselves, since they have neither the time nor the training nor the means at command to carry them out successfully. Whatever these skilled workers may discover in science or practice that is new and useful should be furnished to the farmers in such a form that they can read, digest and apply it practically to the problems which they are called to face in their business. Of course, much of this interchange of thought is directly carried on between the stations and the farmers of the various states. There are also many publications, more or less elaborate monographs, issued from the various divisions of the Department of Agriculture, but this new book, as we understand from the preface, is meant to be a summary of the researches and discoveries of the year, so that the series will ultimately become a standard book of reference for American farmers.

It is still the habit of some newspapers to sneer at the scientific work done in the various divisions in the Department of Agriculture; but this is only the survival of a judgment formed at a period when the chief activity of the department was manifested in the distribution of seeds of common vegetables and ornamental plants, and pretty bad seed at that. But some of the research now made in the various divisions will take rank with the best scientific work in the laboratories of the world. Horticulturists are naturally more directly interested in the studies made by the divisions of vegetable pathology and of entomology, because in recent years science has rendered such material aid in the incessant war which has to be waged against insects and fungi. But it should be remembered that there are other fields where systematized investigation can be quite as helpful. The forage interests of the country, for example, are of enormous value. The hay crop alone is worth \$600,000,000, and this, of course, does not take into account the cash value of the pasture on grazing-lands. More than fourteen million animals are now feeding on native grasses in our vast western ranges, and we can, therefore, realize the vital necessity of securing, if possible, new and better forage plants. The study of grasses attempts to familiarize the people of the country through bulletins and leaflets with the best means of preserving our most nutritious native grasses, and the most promising projects for introducing improved and useful forage plants from foreign countries is a work which must prove of inestimable value, and this is now carried on by Professor Lamson-Scribner, chief of the Division of Agrostology. What is accomplished for agriculture in the Weather Bureau, in the Bureau of Animal Industry, in the divisions of Chemistry, of Pomology, of Botany and of Forestry can easily be understood. Besides all this, the office of Experiment Stations, where the bulletins and reports not only from our own stations, but from institutions for agricultural inquiry in foreign countries, are sifted and compiled and published in convenient form, is constantly furnishing material, so that there will be no lack of matter to fill a book every year which will be indispensable to practical farmers and gardeners.

This first volume may lack the balance and completeness which can be reasonably hoped for in its successors,

but such subjects as the relation of soil to various kinds of crops, the use of mineral phosphates, the relation of water to the growth of plants, the construction of good roads, the food habits of certain birds, the advantages of testing seeds for purity, and many more are treated in such a way that every farmer who reads them will feel himself better-equipped for his daily duties. Altogether, this new departure in the publications of the department takes a most hopeful direction and ought to make it stronger and more efficient.

A Season with the Native Orchids.—II.

ARETHUSA BULBOSA is another beautiful Orchid sometimes found in the shaded bogs of the Pine-barrens, where its flowering season begins in early June. It grows on mossy or Fern-clad hummocks overshadowed by the Nemo-pantes and the Black and the Speckled Alders, where it is not easy to find. It is of low stature, being five or six inches high, and bears a single, or, occasionally, two, large purple flowers on a scape. The parts of the ringent perianth are more nearly alike than those of most Orchids, the lip being a little dilated and recurved toward the tip. At the time of flowering, its solitary leaf is concealed in the sheath of the scape, but it appears after the plant has flowered.

The flowers of *Calopogon pulchellus* are seen some years by the 10th of June, and they may still be found in early August. They are a deep or almost purple pink, three or four often expanding on the stem at once, overtopped by the large inflated buds of later flowers. One of their pretty features is the dilated lip, copiously bearded with pink or purplish hairs, which are enlarged at the tip and stained with yellow. The lip has a kind of hinge near its base, by means of which it easily moves up and down, or falls forward on the column when agitated by the wind or otherwise disturbed. The flowers are bright and showy objects in the damp meadows, lifted amid the grass on slender stems a foot or two high, which rise from a long, linear leaf. It is one of the few Orchids that find their way into the prairies, where it is associated with *Lythrum alatum*, *Oenothera fruticosa* and *Phlox glaberrima*. Sometimes the flowers are a very pale pink, or almost white. *Pogonia ophioglossoides*, a plant of similar habits, but less common, flowers about the same time in June. The two are often associated, the *Pogonia* sometimes forming large beds, and the pale pink or rose-colored flowers so numerous as to impart a rosy tinge to the grassy spots in which they grow. It is a smaller plant than the *Calopogon* and has a smaller single flower, though occasionally there are one or two more on the one-leaved stem. It is fragrant, and has a bearded or crested lip. *Pogonia pendula*, quite like it in habit, but very rare, is a smaller plant, being four to eight inches high. The stem bears several leaves, and usually has three or four flowers in the axils of the upper ones. Those I have found here have the flowers white, or faintly tinged with pink. It is later than the common *Pogonia* and appears in August.

The Twayblade (*Liparis*) is represented by both species of the region covered by Gray's *Manual*. They flower in late June. *L. liliifolia* is the more slender and prettier of the two, with more numerous flowers, ten to twenty in a showy raceme. They have a rather large brown-purple lip, but the remaining parts of the greenish or yellowish-white perianth are so narrow as to be almost capillary. The pedicel is long, and the narrow, reflexed parts of the flower resemble the sprawling legs of an insect. It grows in ravines, in moist clay woods, and in the damp sands, usually in the shade, and is quite rare. *L. Loesellii* is more abundant, being found throughout the sand region in moist soil in grassy open places. It is a stout little plant, from four to twelve inches high, with rather small, yellowish-green flowers, the parts of which are also narrow. The flower-bearing bulb almost always has that of the preceding year attached to it, surmounted by the withered scape or a remnant of it.

The Coral-roots have purplish or yellowish stems and flowers and a queer mass of hard, fleshy roots resembling some kinds of coral. They readily break in pieces when removed from the ground. The lack of green in the stem and rudimentary scale-like leaves suggests parasitism, but I have never been able to trace any connection between their roots and those of other plants. Fibrous roots from other sources run in among their roots, but are loose and seem unattached, and no haustoria have been detected. Their roots are commonly well down in the soil, but not so far as to be below the leaf-mold, which abundantly covers the ground where they grow, so that they may be saprophytic if unable to elaborate inorganic food by themselves. *Corallorrhiza innata* is the earlier and more slender of the two, flowering in May and June. It is only occasionally met with on the moist sand ridges among the Pines. *C. multiflora* is a stout plant, with a purplish, many-flowered stem, and is more often seen in the dry upland woods and wooded ravines. Its large, oblong pods depending from the stem soon become the most prominent features of the plant. It is in bloom from midsummer till September.

The genus *Habenaria*, or Rein-Orchis, is represented here by ten species, all but one or two being common. Those with green or greenish flowers are the earliest, *H. bracteata* leading the way by the middle of May. *H. Hookeri* is almost as early. It is found in the damp Pine woods, and has two large orbicular or oval thick and glossy leaves, which lie close to the ground. It reaches a foot in height, and though the flowers are larger than most of those of the green-flowered kinds, they are dull and unattractive. It is a lonely plant, springing up from its bed of Pine leaves, on which its own two shining leaves rest. *H. tridentata* is a plant of the wet woods, with a low stem carrying a single full-grown leaf and very small flowers. *H. virescens* and *H. hyperborea* are taller plants, with stout, leafy stems, and occur in peat-bogs as well as in wet meadows and woods.

The most beautiful of the *Habenarias* belong to the group of Fringed Orchids, which have the lip, and often some other parts of the flower, variously fringed and dissected. They occur most abundantly in July, but some are found the last of June and in the early part of August, and all are denizens of wet ground. *H. ciliaris*, the yellow Fringed Orchis, easily takes the lead as the finest of the group, and is one of the most beautiful of all our native Orchids. The lip of the showy orange-yellow flowers is furnished with a long hair-like fringe, and the petals are also cut into a similar but shorter fringe. It delights in the wet sands, and multiplies quite freely by tuberous roots, some of which attain the length of three or four inches. The connection with the parent plant finally withers away and dies, but the plant being a perennial, little groups or colonies result, with the connection with the parent plant more or less traceable, or sometimes quite fresh. *H. psychodes*, the Purple-fringed Orchis, multiplies in a similar way. It is also very handsome, having a long dense spike of numerous smallish pink-purple flowers, which are pleasantly fragrant. The broad wedge-shaped lip is cleft into many short divisions. The plant is sometimes found in the deep shade of swamps, in the midst of Mosses and Ferns, but it is oftener seen in the bogs and wet meadows bordering the swamps, or growing amid the grass in the more open thickets. *H. lacera*, the Ragged-fringed Orchis, is much less common, and occurs in moist thickets. The greenish flowers, with their narrow lip deeply parted into a long capillary fringe, are always objects of interest if not as attractive as those of their more brightly colored congeners. *H. leucophaea* is another of the greenish-tinged species, but is frequently found with flowers varying toward white. The fan-shaped lip is copiously divided, and the flowers are rather large and very fragrant. It bears a long loose spike and forms a pretty object in the wet meadows. It can be grouped with the prairie Orchids, and is one of our most common species. It was formerly abundant in the wet prairies, where

cultivation has now largely destroyed it. It is the largest of the Habenarias, being sometimes four feet high, and blooms from the last of June till August. *H. blephariglottis*, the White-fringed Orchis, is a plant of the peat-swamps or open borders of wet woods, and is our rarest species. The white flowers are very beautiful, being similar to those of *H. ciliaris*, but with a lip less abundantly and more irregularly fringed. It is a lower plant than most of the other fringed Orchids, rarely more than a foot high.

Goodyera pubescens, one of the Rattlesnake Plantains, is sparingly found in the Pine district. The dense spike of greenish white, glandular pubescent flowers appears in July and August. Its chief attraction is the tuft of thick and spotted or white reticulated leaves at the base of the flower-stalk. Their texture is rich, and their variegation makes it one of our most beautiful-leaved plants. Closely allied to this in floral structure are two species of *Spiranthes*, or Ladies' Tresses. *S. gracilis* comes into bloom about the first of July, and lasts well along into September. Its floral season is, therefore, longer than that of any of our Orchids. It is a pretty little plant with its spike of small white flowers winding spirally around the slender stem. It is a frequent plant of the Pine woods as well as of ravines and wooded slopes. *S. cernua* is a stouter and much more abundant plant of wet grassy lands both of the Pine-barrens and the prairies, blooming in September and October. The white waxy flowers are very sweet-scented. It has a tendency to persist in the meadows after they have been subjected to cultivation.

This plant closes with the frosts of autumn the Orchid season, which began with *Orchis spectabilis* in late April. At no time after the appearance of the Showy Orchis will the woods and fields be without flowers of some of these charming plants, most of which are handsome and all of them curiously constructed. Their contrivances for cross-fertilization and their insect visitors are not the least of their entertaining features, and provide a constant source of enjoyment and instruction for those interested in this phase of plant and insect life.

E. J. Hill.

Notes on some Arborescent Willows of North America.—III.

SALIX ALBA × LUCIDA (see fig. 57, page 424).—Leaves lanceolate, narrowed at base, tapering to a cuspidate-acuminate point, closely and sharply glandular serrate, firm in texture, dark green, but not glossy above, glaucous beneath, clothed at first with silky, ferruginous hairs, which are more or less persistent beneath; petioles glandular; stipules (present only on vigorous sterile shoots) lanceolate, half the length of the petiole; aments leafy, peduncled, gracefully cylindrical, usually flexuose; scales villous at base, naked above, erose dentate; stamens three to five; capsule taper-pointed from an ovate base; pedicel two to three times the length of the gland; style short, but distinct; stigmas bifid.—Exsicc., Bebb, *Herb. Salicium*, No. 41.

SALIX ALBA(subspec.) *PAMEACHIANA*, Andersson, *Sal. Monog.*, 48 (1864); De Candolle, *Prod.*, xvi., part ii., 242 (non *S. Pameachiana*, Barratt!).

Habit of growth vacillating between that of the two parents; sometimes a large, branching shrub, as in *Salix lucida*, at others a small tree twenty-five to thirty feet in height, with a distinct trunk; as in *S. alba*; year-old twigs yellow or bronzed, stained with crimson in the sun, sometimes brownish. Near Amherst, Massachusetts, where, during the summers of 1872-73-74, Professor H. G. Jesup collected numerous forms of this hybrid; Westville, Connecticut, Mr. J. A. Allen, a form with staminate aments more like *S. lucida*, but stamens only two to three; Providence, Rhode Island, Mr. S. T. Olney. The same tree from which specimens were taken for Mr. Carey, which served as the type of Andersson's *S. alba Pameachiana*.

Ithaca, New York, Professor W. R. Dudley; Newark, Wayne County, New York, Mr. E. L. Hankenson.*

Distinguished from *Salix lucida* by the narrower leaves; narrower and pointed stipules, more slender aments and fewer stamens; from *S. alba* by the leaves darker green above, often rusty pubescent beneath, and more sharply serrate; more tapering capsules, longer pedicel and style, and especially by the dentate scale, which is a distinctive derivation from *S. lucida*.

SALIX NIGRA × ALBA (see fig. 58, page 425).—Briefly described, this has the foliage of nigra and the aments of alba. The leaves, however, bear a still closer resemblance to some forms of *S. nigra × amygdaloïdes*, being pale or glaucous beneath, with a long, tapering, cuspidate point. The petioles are shorter, more glandular and downy. The conspicuous and persistent stipules are acute or acuminate, with a mucronate point. Fertile aments scarcely distinguishable from *S. alba*, the capsules greenish and sessile. Staminate aments cylindrical, erect, densely flowered, wanting altogether the loose arrangement of the flowers on the rachis common to both parents; stamens usually three, less frequently four or five.

Found near Newark, Wayne County, New York, by Mr. E. L. Hankenson, who has, for many years, assiduously studied the Willows of his locality. Mr. Hankenson writes of this hybrid as follows: "The two large trees which first attracted my attention were forty feet or more in height, with trunks one to two feet in diameter. These were cut down in 1882. The trees now standing, four in number, grow on the bank of a brook in the same immediate locality, only a few rods apart, and are about thirty feet high. *Salix nigra* grows with them, and only a few rods above, where the road crosses the brook, are several old trees of *S. alba vitellina*. In general appearance this hybrid resembles *S. amygdaloïdes*; the leaves are much the same, but firmer in texture, darker and more glossy above and more distinctly and uniformly glaucous beneath. The large branches, too, have the same smoothness and greenish hue."

The possibility of this cross being demonstrated, it seems remarkable that it has not been more frequently repeated, for in the older settled portions of the country it is very common to find the two parent species growing together on the banks of streams. It would seem, however, that the fertilization of *Salix alba* by *S. nigra* is not favored by nature, and this view may find some correlative support in the fact that in Europe, where *S. triandra* is the geographical equivalent of *S. nigra*, and a species which has entered into some of the most remarkable crosses on record, no hybrid between *S. triandra* and *S. alba* is mentioned by Andersson.

Rockford, Ill.

M. S. Bebb.

Plant Notes.

SASSAFRAS SASSAFRAS.—Few of the forest-trees of eastern North America are more beautiful at this season than this member of the Laurel family when its large variously formed leaves have turned to delicate shades of yellow and orange, sometimes tinged with red. The fruit, which, as a rule, is sparingly produced, is abundant in some years, and as it ripens in September and October it adds much to the beauty of the tree at this season, being dark blue and surrounded at the base with a bright scarlet calyx-tube and raised on a thick scarlet stalk. The birds relish its aromatic flavor, however, and they usually eat it as soon as it begins to color. The beauty of the Sassafras is not confined to autumn. Its shining green branches in the winter, its drooping clusters of pale yellow flowers in early spring,

* Professor Porter finds near Easton, Pennsylvania, a singular form so different from all that have entered into the above description that I have hesitated to include it among the rest, and yet it can scarcely be other than a hybrid *Salix alba* × *lucida*. The young leaves accompanying the full-grown, but not overripe, capsules are fully one inch broad even when not more than three inches long, covered with silky white hairs when just expanding, soon smooth. The fertile aments are not distinguishable from *S. alba*. The staminate are rather thinly flowered, but the individual flowers are so conspicuous as to give the ament an appearance unlike either that of *S. alba* or *S. lucida*. The scales are pale, 1½ mm. wide by 3 mm. long, and even more distinctly dentate than in genuine *lucida*; stamens mostly four.

Fig. 57.—*Salix alba* X *lucida*.—See page 423.

1. A flowering branch of the staminate tree, natural size. 2. A staminate flower, enlarged. 3. A fruiting branch, natural size. 4. A fruit, enlarged. 5. Scales of the staminate and pistillate flowers, enlarged.

its healthy and fragrant leaves in summer, make it most attractive at every season. It is a tree of neat and individual habit, with an average height in this latitude of about forty feet, with stout, and often twisted, branches placed nearly at right angles with the stem, so that the foliage lies in strata and forms a rather flat head. In a full-grown tree

the red-brown and deeply furrowed bark gives the trunk a most picturesque appearance. The Sassafras ranges from the shores of Massachusetts Bay to Florida and west beyond the Mississippi, and reaches its maximum size in southern Arkansas and the Indian Territory, where trees are not uncommon with trunks six or seven feet through

Fig. 58.—*Salix nigra* × *alba*.—See page 423.

1. A flowering branch of the staminate tree. 2. A staminate flower, enlarged. 3. Scale of a staminate flower, enlarged. 4. A flowering branch of the pistillate tree, natural size. 5. A fruit, enlarged. 6. Scale of a pistillate flower, enlarged. 7. A summer branchlet, natural size.

and eighty feet high. Large individual trees are often seen much farther north, and on page 215 of vol. vii. we gave the portrait of a tree on Long Island which has a diameter of forty-three inches at two feet from the ground. Although it is so common, like many other native trees, it is much neglected by planters, notwithstanding its usefulness. It is

easily raised, too, for if the seeds are planted as soon as they are ripe they will germinate next spring, and the suckers, which are often produced in great abundance, can be easily transplanted. To many persons the Sassafras is interesting from its relationship to such trees as the Bay, the Cinnamon and the Camphor, and perhaps its aromatic flavor

helped to give it the reputation for sovereign curative properties which made it so eagerly sought for by Europeans for two centuries. Thoreau, who found poetry about him everywhere, wrote in his journal, "When I break a green twig of Sassafras as I go through the woods in February I am startled to find it as fragrant as it is in summer. It is an importation of all the spices of an oriental summer into our New England woods, and very foreign to the snow and the brown Oak leaves."

EVONYMUS ALATUS.—There are about forty species of *Evonymus* scattered throughout the northern hemisphere, the greater number of them coming from the tropical regions of China and Japan. Many of them are valued in gardens for their handsome foliage and brilliant fruits. Our native Wahoo, or Burning Bush, *E. atropurpureus*, is an inhabitant of many old American gardens, but it is not so bright in fruit as some garden forms of the well-known Spindle-tree, *E. Europaeus*, which has been cultivated for centuries. *E. Japonicus* is one of the most ornamental of evergreen shrubs, and the variety known as *E. radicans*, with climbing stems and persistent small leaves, is an admirable substitute for Ivy where plants of the latter will not succeed. The Japanese *E. alatus*, however, is much superior in its autumnal foliage to either the American or European plants, although its fruit is less brilliant. This plant is abundant in the central mountains of Japan and in the northern part of that country. It is perfectly hardy in New England, and makes a handsome compact shrub. Its claim to distinction, however, is the remarkable colors of its foliage in autumn, which in individual specimens is a clear rose-pink quite unlike that of any other woody plant.

COSMOS SULPHUREUS.—Among a number of seeds from New Zealand, disseminated by a well-known Swiss plantsman in 1894, were supposed to be those of this annual. They were again offered this season by a prominent English seedsman and, perhaps, others. This proves to be a case of mistaken identity, the seeds being those of a Bur Marigold, *Bidens ferulæfolia*, a plant allied to the *Cosmos*, and also from Mexico originally, but very distinct from *Cosmos sulphureus*. *Bidens ferulæfolia* is an annual with numerous slender stems, narrow leaves and golden-yellow flowers with narrow oval florets. It reproduces itself readily from self-sown seeds, and forms spreading masses a foot or one and a half feet high. It is rather pretty, but would not be generally appreciated in gardens. *Cosmos sulphureus* of Cavafilles, or *C. Artemisiæfolia*, is distinctly different and a rare plant in cultivation, though described many years since. It has not yet been offered by seedsmen, though it is likely to be on the market for next year. We have recently seen strong, well-grown plants four to five feet high, much branched, the leaves with wider pinnæ than the well-known *C. bipinnatus*. The flowers are similar in form to this species and are of about the same diameter—about three inches. The petals are slightly incurved, and they vary in color from sulphur to deep orange-yellow, and are of good substance. When it is added that the plants commence to flower in a young state in midsummer, or earlier, and continuously till fall, it will be seen that we have in this *Cosmos* a real addition to annuals of the first rank.

HELENIUM GRANDICEPHALUM.—The flower-heads of this fine autumn-blooming plant are nearly two inches across, with a globular brownish disk, and wedge-shaped ray-florets of a rich yellow color suffused with red. The ovate-lanceolate leaves are three inches long and connate at the base. The plant branches freely and grows to a height of eighteen inches or two feet, according to circumstances. It is very floriferous and reminds one of some of the smaller single *Gaillardias*, both in color and habit. This is a promising new hardy perennial, possessing all the good qualities of the more robust *Compositæ*, without the weediness which detracts so much from the appearance of so many of them at this season. It can be propagated by seeds, and will, no doubt, become as popular as it is interesting and beautiful.

PYRETHRUM ULIGINOSUM.—The great Ox-eye Daisy, which has become quite common in American gardens, as it deserves to be, is one of the few late-blooming *Compositæ* with white flowers, the majority of them being yellow or purple. It is a beautiful and floriferous species, producing numerous heads two inches or more across on slender leafy stems. The disk is comparatively small, pale yellow; the ray-florets long and narrow, pure white. The lanceolate, coarsely serrate leaves dull green above and grayish beneath. The habit is branching, and the plant is so well covered with foliage that it is useful, even when not in flower. It reaches a height of two or three feet and is completely covered with flowers as late as September. In order to develop the finest qualities of this plant it should be grown in a rich and moist ground, along the borders of lakes or streams, or in rich cultivated ground in smaller gardens. During dry spells abundant watering is necessary, as the lower leaves dry up quickly, and the flowers are of short duration unless grown under proper conditions.

ALOCASIA (CYRTOSPERMA) JOHNSTONI.—This is one of the boldest and most striking species of *Alocasia*, with leaf-stalks five or six feet tall. The blade is arrow-shaped, about two feet long, with the back lobes spreading and somewhat longer than the front lobe. The veins are bright rosy-red, very marked, and contrast beautifully with the olive-green, mottled surface of the leaf. On the lower side the ribs are very prominent, slightly spiny and mottled. The leaf-stalk is slender, tapering, almost erect, mottled with dark bands and somewhat spiny. This is a useful plant for large conservatories, and it is also available for house-culture, as it will thrive well in a shady position in a comparatively low temperature. It is one of the rarest plants of its class and is, perhaps, not to be found except in one or two places in this country. The soil should either be a rich vegetable loam or peat, in which it seems to grow equally well. When grown in a cool place, watering should be moderate; in a high temperature daily watering and spraying of the foliage becomes necessary.

Cultural Department.

Lilies.

THE past season has been more than usually favorable for Lilies in this part of the country. Copious showers at frequent intervals were the rule all the time they were growing, and the long, protracted dry period did not come until the bulbs were mature and beyond injury. For the best success Lilies must be planted in a cool moist soil that never becomes hot or dry, and preference should be given for a spot that is shaded by other growth, either that of deciduous shrubs or broad-leaved evergreens, in which positions most of the hardy kinds flourish for an indefinite period. It has been emphasized before in the columns of *GARDEN AND FOREST* that fall-planting is always best; there appears to be no exception to this rule, and the reason is plain. If a Lily-bulb be examined at any time soon after flowering it will be seen to have made a quantity of new roots from the base of the bulb, strong, vigorous feeders, that will continue to grow all winter in a favorable place, and when spring comes, and with it the flower-shoot, there is plenty of root-action to give it impetus until the thick matted whorls of roots are emitted from the lower part of the stem itself; these are made to give strength to the plant to produce flowers, and to build up the bulb again after it has made its supreme effort the alternating set of roots come again from the base. It has been part of my experience to unpack large quantities of Lilies just as they arrive from Japan, where the system of packing is a good one, each bulb being placed in a piece of wet clay, which is rolled round the bulb, then dried, and these are placed in the cases, and the intervening space filled up with dry clay soil. If all is perfectly dry, and kept so, root-action is entirely suspended; but if, as sometimes happens, moisture is admitted from some cause or other, the whole mass of soil will become matted with roots, and on their arrival here it is quite difficult to separate the bulbs. Japan Lilies arrive usually just a little too late for planting in the open ground in this section, and, perhaps, in most others, so that dealers keep them over and make them a part of their spring trade; but it would be preferable always

to get them as soon as they arrive, and pot them up, placing the pots in a frost-proof cellar until they start in spring, when they can be planted out when the ground is favorable.

Complaints have been frequent lately that *Lilium auratum* does poorly even the first season after importation; this seems to be due wholly to spring-planting, for if the shoots appear it is often only to dwindle away or become ill-formed, showing clearly that there is no adequate root-action to second the efforts of the bulbs. If these were obtained on their arrival in November and planted in good rich soil in six-inch pots, we should hear much less of poor results the first year. After this, *L. auratum* seldom makes a strong growth; at least, I have yet to see a planting that has stood the test of years. Some plants that have been reported as flourishing for a term of years have proved to be the broad-leaved form, *L. auratum platyphyllum*, that seems to have traces of *L. speciosum* in it, and has inherited the vigor of that species. This plant is also known as *L. auratum macranthum* from the size of its flowers, which are sometimes over twelve inches in width. There is also an unspotted variety of this called *Virginale*. It would be well if Japanese cultivators gradually grew this variety to the exclusion of the typical one, for with their system of culture it ought not to take long to get up a large stock. The cost of the variety is now two-thirds more than that of the typical bulb, but once set out there is no need to renew them, for the plants increase and grow better from year to year.

For the past ten weeks we have had a fine show of *Lilium speciosum* for decorative purposes, and the plants would have lasted two weeks longer but for the sharp frosts of the past week. All the forms of this Lily are well adapted for growing in pots, or if larger specimens are desired, wooden tubs or boxes may be made for them and painted green. Southern cypress is here no more expensive than good pine, and lasts very much longer, so that we are using it for all indoor work now. The *Speciosum* group is admirably adapted to this method of culture, and it affords alone such variety that it makes others undesirable at the same period. The kind we have always regarded as the best dark form is known in trade-lists as *Melpomene*. This is a native of Japan, and in no way connected with the kind raised by the late C. M. Hovey, of Boston, which was a hybrid between *L. auratum* and *L. speciosum*. It is possible that the same name has been applied to two kinds, the former not now being in cultivation. As we get it from Japan, this Lily is most vigorous, the flowers are of darkest crimson, heavily spotted, with pure white margin, the flower-stalks being red. There is another variety called *Roseum* that has green stems, with lighter-colored blooms, and is the next best-colored variety. The variety sent annually from Holland is quite inferior to those we get from Japan in these days, as the Dutch growers seem to keep on multiplying the kind first sent them, and the bulbs are never as large as those from Japan, nor is the growth as strong. Of white forms, the one sold sometimes as *Album præcox*, or *Krætzeri*, is the best of all, being pure white, with dark brown anthers. Among them, however, at flowering-time we notice at times plants of the variety known as *Album novum*, with anthers of light golden-yellow color, which is a constant character. These four are the best of the varieties of *L. speciosum*, and there are about a dozen altogether offered in lists. Rich soil is essential for these Lilies when planted in pots or boxes, and it is well to add plenty of bone-meal to what would be regarded as a soil good for Roses. The effect of the bone is lasting, and when repotting directly after the flowers are over each year it is not desirable to disturb the mass of roots, but simply to shift them on into larger pots, so that the full benefit of the bone will be appropriated. Liquid stimulants are also given about flowering-time, for the old theory that manure in any form is injurious to Lilies has been exploded. They are, in fact, great feeders, and need an abundance of good stimulants to get them to their best year after year. In order to have them for a long period we store them all in the cellar after they have been potted, and they are brought out in batches as they start in spring, so that we get about six weeks' difference between the flowering-time of the first and last lots.

A good early Lily, and one that might be had at Easter-time in pots, is *Lilium pomponium verum*, the bright scarlet Turks'-cap fragrant Lily. The name *verum* is of catalogue origin, and is used to distinguish the red from the yellow form, *L. Pyrenaicum*, which is inferior as a garden plant and is of short duration in cultivation, while the scarlet form is in all respects a good Lily; it is the first to bloom outdoors in early summer, and will thrive in sandy soil. It resembles very much the Siberian *L. tenuifolium*, but the flowers are from ten to twelve on a stem. It is a native of the south of France, and usually comes with the *L. candidum* early in autumn. There is a diffi-

culty in obtaining this Lily in quantity now from dealers here—at least, such has been our experience lately; but it should become better known than it is, as it is in every way a better garden plant than the *L. tenuifolium*, so much lauded of recent years.

South Lancaster, Mass.

E. O. Orpet.

Carnations and Chrysanthemums.

THE past season has been very favorable in this section to Carnations planted out-of-doors. All the plants are now housed and look well. With one exception, growers have had little trouble with the dreaded rust. Some consider the immunity due to extra care in selecting cuttings and in keeping the stock healthy and growing until planted out in spring. Many growers are careless in this respect, and some disseminators have been guilty of sending out diseased stock. There is no doubt that cleanliness is a great preventive of disease and necessary to insure success. Mr. Tailby, of Wellesley, declares he has not a speck of rust on his place, and thinks this is due to dipping his cuttings in a dilution of the new fungicide, Lysol.

The variety Mrs. Fisher, which has until now been considered the best white, must give place to Alaska. This variety was raised by the late Mr. Chitty, of Paterson, New Jersey, who exhibited specimens in superb condition at the last Carnation meeting held in Boston during last spring. Its lasting qualities at this exhibition were remarkable. Mr. Nicholson, of Framingham, Massachusetts, a well-known expert, went to Paterson to examine it growing, and found it even better than at the Boston exhibition. It is of free growth and sturdy habit in the field, and a profuse bloomer in the greenhouse. Mr. Tailby has been a grower and raiser of Carnations for thirty years, and his acquaintance with varieties, new and old, is extensive. He says that in many respects Alaska resembles Snowdon, an old variety of ten or a dozen years ago, possessed of many fine qualities. Its main defect was a tendency to produce a head, or bunch, of buds, to the detriment of the leading bud. He attempted repeatedly, by crossing and recrossing, to remedy this defect, but never succeeded fully. All seedlings possessing to any degree the merits of Snowdon had also its defects.

Mr. Zirngiebel, of Needham, Massachusetts, is undecided between Alaska and Pride of Erlescourt for best white. The latter, according to some growers, does not last well when cut. Portia is a grand scarlet, and still a great favorite. It is especially free in flowering during the early part of the season. Although a continuous bloomer, it does not compare with Hector in size, which, however, is later. E. G. Hill is another fine scarlet of neat low growth, and well suited for front benches. As yet there is no ideal scarlet in the measure that William Scott is the ideal pink. Daybreak is looking well wherever seen. It is blooming freely, with fine long stems; the flowers of the largest size, of charming peach-blossom shade. Besides being one of the handsomest, it is also one of the most profitable varieties grown, nearly every shoot bearing a flower. Nicholson, for its large size and lovely form, is one of the handsomest varieties grown. It is a carmine-pink of pleasing shade with a peculiar lustre or sheen not possessed by any other variety. Mr. Zirngiebel has a cross between Nicholson and William Scott. It is fairly intermediate, having the erect habit and form of flower characteristic of the seed parent, while in size and color the flowers more nearly approach those of the pollen parent. Eldorado is the long-looked-for profitable yellow, but, like its predecessors, it is not a pure yellow. It is, in fact, a finely fringed and fragrant Picotee, edged carmine, on a yellow ground, and a most beautiful Picotee, too. To produce such a magnificent winter bloomer in this (Picotee) section is an achievement of which Mr. Shelmire, of Avondale, Pennsylvania, may well be proud.

Report comes that blooms of the Chrysanthemum Yellow Queen were offered for sale on September 27th, and of Madame Bergmann and Madame Lacroix on the 28th. This is unusually early. I once cut blooms of Madame Lacroix on September 28th, but these were from early crown-buds. Even though the blooms appeared open enough to cut, there was an apparent tightness in the buds which gave the impression that the flowers were not developed. Blooms from crown-buds are never as satisfactory for any floral arrangement as those from terminals. The larger bud characteristic of the crown is never thoroughly hidden by the expanded flower, as in the case of terminals, nor is there certainty of a perfect bloom as there is from a terminal bud; some are sure to be deformed.

From my own observations, the season is a few days late,

perhaps owing to the unseasonably warm weather of the middle of September. Certainly, the blooms do not mature quickly until the nights begin to get cool; for, even when Chrysanthemums are housed, the conditions indoors must have some relation to those existing outdoors, and so natural to the plant. It has been proven that no amount of forcing will, in fact, bring a plant earlier into bloom; and when fire-heat is used it is rather to maintain a dry air as a preventive of mildew and other fungoid diseases so disastrous to the foliage in the later stages of the development of the plant.

Mrs. Henry Robinson is the first variety to bloom here. It is a white-flowered Japanese incurved, regular and graceful in outline. So far it is the best early white. The coming popularity of the Japanese incurved, of neater and more graceful outline, to the exclusion of the coarser varieties which had only size to recommend them, may be considered as indicating an advance in taste. Mrs. E. G. Hill was cut on the 5th of October last year, but will not be ready to cut this year until the 15th, to be followed a day or two later by Nemesis and M. J. Parker, Jr., both pink. Ivory will not be open until the 20th, with Crystallina at about the same date, after which the season will be fairly opened.

The scorching or burning of many crimson and pink varieties is a matter which has troubled growers for a number of years. It is discouraging to see a large, well-formed bud with half the bloom blighted on opening. It looks as if lenses might have been formed by water on the under side of the glass, through which the sun's rays had passed with added power. This is the idea many have; though I cannot explain the trouble, I do not think this explanation correct. I know shading will not altogether prevent it, although it may to some extent. I think the injury is done in the bud state, but does not become noticeable until development proceeds. I have noticed, in the morning, dew covering the very fine pubescence on the outside of the unexpanded florets. I think less scorching would result if this dew could be evaporated by airing early, or some ventilation could be left on overnight, with heat enough to keep the air dry, so that this dampness could be cleared off before the sun gained power. I have followed this plan consistently this season, and so far I have not seen a sign of the trouble. The trouble with William Seward, a fine early crimson, began last year when in the bud state; the buds are now—October 14th—well forward in opening and all perfect.

The finishing touches have been given to our specimen plants for exhibition.

T. D. Hatfield.

Notes on Apples.

THE Red Beitingheimer Apple, which was so favorably noticed in GARDEN AND FOREST for September 25th, page 390, has fruited here several years. While it has valuable qualities for culinary and market purposes, its flesh is rather coarse, and it would not be called a good dessert fruit except by those who like a brisk subacid flavor. On account of its symmetrical form, large size and handsome color no apple in the station collection attracts more attention than this at fairs and exhibitions. Under good cultivation it is a free grower and a regular and abundant bearer. The fruit is very large, and quite apt to drop before it is well colored. This fault is more serious with the Red Beitingheimer than with Wealthy, Alexander or Gravenstein, and probably will prevent its being planted extensively in commercial orchards.

Among the comparatively new or little-known varieties of considerable merit is the Sharp. The fruit resembles Maiden Blush somewhat in shape and color, and is better for dessert use than that variety. Its flesh is nearly white, fine-grained, tender, moderately juicy, nearly sweet, of mild pleasant flavor and very good quality; season, October. The tree has fruited here but three years, but it appears to be a good bearer.

One of the handsomest late August and early September apples in the station collection is the Stump, which is excellent for market or home use. It begins to ripen soon after Che-nango Strawberry, which it resembles in shape. The tree is upright and productive. The fruit, borne on short spurs close to the limbs, is pale yellow, beautifully striped and shaded with red. Flesh firm, crisp, tender, subacid, mild in flavor.

Switzer is a very handsome German apple that begins to ripen about the first of August. The fruit, which is of medium size, is nearly white, with a beautiful blush. It is very good in flavor and good in quality either for dessert or for culinary use. The tree is productive.

Williams' Favorite is a dessert fruit that should be more widely known. Its symmetrical form and deep red color make

it an attractive apple in market. It is also desirable for home use, as it is good in flavor and quality. The tree makes moderate growth and is a good bearer.

Among the October apples desirable for culinary use may be mentioned Cox's Pomona. It is an old variety of English origin. The fruit is large, highly colored with crimson on a clear, very pale yellow ground, making it an attractive market fruit. The flesh is white, crisp, subacid. It cooks evenly and ranks good in quality.

Experiment Station, Geneva, N. Y.

S. A. Beach.

California Irises.—Like many other plants native to the California coast, the Irises are not satisfactory under ordinary cultivation. *I. Macrosiphon*, which grows so vigorously in northern California and Oregon that the long slender leaves, with the strong fibres which form their edges, are used for making ropes, fish-lines, nets and coarse cloth, has been rarely seen in such robust form elsewhere. The beautiful *I. bracteata*, too, which is figured in the first volume of GARDEN AND FOREST, page 43, has also proved troublesome to cultivators. In regard to these two plants Herr Max Leichtlin writes that he has received them from their native quarters fresh and looking healthy, but, after many trials, they have never lived long. He has found, however, that they can be moved when they are in full vegetation. They must be grown from seed, and the seedlings must be allowed to remain where they are until they have formed solid root-stocks. After this, and when they are beginning to grow, they can be safely handled and transplanted like other Irises. This spring Herr Leichtlin had plants with twelve to thirty flowers open at the same time in all shades of ochre and cream color. They certainly are striking plants, and it is to be hoped that growers will test this treatment in eastern North America.

Elizabeth, N. J.

J. N. G.

Aglaonema commutatum.—Unlike the rest of the family, this species is quite showy when in flower, and as its numerous spathes are freely produced it is well worth growing for the sake of the flowers alone. The leaves, while quite ornamental, are less richly colored than those of *Aglaonema pictum* or even *A. nebulosa*. They are eight or ten inches long, green and glossy, with a few silvery spots scattered over the surface. The spathe is two or three inches long, spoon-like, of a creamy white and waxy in texture. The spadix is cylindrical or slightly tapering to the base. The stem is thick and fleshy, covered by the sheathing petioles of the leaves. The plant is generally kept dwarf and compact, side shoots being freely produced if the main shoot is topped. It is most ornamental when only eight or ten inches high, but broad and spreading.

Short Hills, N. J.

N. J. R.

Correspondence.

Garden Notes from Southern California.

To the Editor of GARDEN AND FOREST:

Sir,—*Ipomoea versicolor*, or, as it is commonly known in gardens, *Mina lobata*, a charming climber from tropical America, is still a comparative stranger to our people, but it is admired by all who have grown or seen it. It makes a quick and truly tropical growth, climbing to the top of whatever support is given to it and reaching still upward until it bends under its own weight. The mass of dark green foliage is refreshing in a thirsty land, but when the slender spikes of buds appear, at first of a rich poppy-red, gradually changing to a delicate canary-yellow, the plant is strikingly handsome. When fully open the flowers are pure white, slightly tinged with yellow at the base of the corollas, and a faint, almost perceptible, ring of rose-purple around the edges. The spikes of flowers are in pairs, like the tines of a fork, erect, with a graceful curve, and carrying thirty to forty buds and flowers; the flowers at the base of a pure white, like the down of a bird's wing, and the brilliant buds at the tips heighten the fancied resemblance to the wings of a parrot, whence comes the popular name of the plant among the Mexicans, who call it *Ala de Perico*. In some of the villages in the warm portions of Mexico I found that this vine was grown in every yard in the greatest profusion. The exert filaments are twice the length of the corolla, and are of a straw-yellow, the anthers of an Indian yellow. The plants wilt before the least touch of frost, and mature seed with great uncertainty; probably to this fact, and the consequent high price of the seed, is due its rarity in American gardens.

Lantana delicatissima is probably a Mexican shrub, although

its native country is unknown. The slender flexuous branches make it a trailing plant when without support. The rather scattering umbels of phlox-purple flowers usually contain one or more flowers, with a canary-yellow centre bordered with white, followed by a fruit slightly resembling a blackberry. It seems to be easily propagated, and is said to have once been a favorite in eastern conservatories, but it flourishes here at all seasons out-of-doors.

Narcissus Corycensis, a dainty species sent to us from the Holy Land, bloomed on Christmas Day. The flower was single, pure white, with a tiny orange-colored cup, the whole less than an inch across, and borne on a stem just three inches high. Other plants of the same species bloomed late in September. This species is referred to N. Tazetta in the *Index Kewensis*.

Orcutt, Calif.

C. R. Orcutt.

Bulletins of the Experiment Stations.

To the Editor of GARDEN AND FOREST:

Sir,—I should like to add a word to what you said last week on the experiment stations concerning the mechanical make-up of the bulletins. Some of those which I received are printed on the flimsiest of paper with battered type, and the numerous typographical errors show that they have had nothing like careful revision or proof-reading. Others show attempts at illustration which are half-tone reproductions of photographs taken with cheap lenses, and carelessly printed at that. Now, an illustration which is made to enforce some lesson ought to be accurate, and certainly if it is used simply to make the bulletin attractive nothing but the very best work is worth using. It seems to me that no clean, sharp, scientific work can be expected in an office where the publications are of such a low mechanical and artistic quality.

Bloomfield, N. J.

S. R.

[It is probable that in some states the stations ought not to be held responsible for the mechanical quality of their bulletins. It is sometimes the case that there is a state officer who is authorized to do all the public printing, and it may be that under such regulations the station authorities have not the power to secure such paper, type and press work as they desire. It is to be hoped, for example, that neither the board of control nor the director of the Ohio Experiment Station is responsible for the paper or the printing or the illustrations in the thirteenth annual report of that station, which is dated December, 1894, but which has just come to hand.—Ed.]

How to Exterminate Cat Tails.

To the Editor of GARDEN AND FOREST:

Sir,—Will you kindly inform me under what depth of water common Sedge Grass and Cat Tails will live? I have a swamp of fresh water, and it is now nearly covered with these Grasses. I can at a small expense have them cut a foot below the surface, and then I can raise the water until it is everywhere three or four feet deep. Can I stop the growth of these plants in this way and thus secure a clean surface of water?

Newark, N. J.

T.

[When Cranberry-bogs are prepared they are flooded in this way, and if the pond is kept four feet deep continuously through the season the bog-plants are practically destroyed. Mr. William Tricker, however, writes that while Sedge Grass cannot live under this depth of water, he has seen Cat Tails survive in water three feet deep. His advice is to draw off the water if possible, and in the spring, as fast as the Cat Tails appear, to pull them up and keep at it until they are exterminated. If this is impracticable, persistent cutting of the tops will kill them, although it may be a tedious job. Of course, when the tops are constantly cut the roots cannot mature and will ultimately die. We should be very glad to publish the experience of any one who has had success in exterminating Cat Tails.—Ed.]

Railway Station Gardens.

To the Editor of GARDEN AND FOREST:

Sir,—Referring to a note in No. 388 of GARDEN AND FOREST, concerning the prizes offered for the best station gardens by the Midland Railway in England, I would say that these station gardens are among the brightest memories of a recent

visit to England. The glimpses of flowers one gets as the train shoots by a small station, or the view, when the train stops at a larger one, of carefully tended beds with thousands of bright blossoms, were always refreshing. The better flowering annuals were often employed in good-sized beds, and Roses in their season were always abundant and left a most pleasing impression. There is no need of our literally copying the English style of planting, but it would be well if the directors of some of our roads would imitate this English example in a general way and make the spaces about our railway stations, which are now bare and often unsightly, beautiful with greensward, well-selected shrubs and plants.

Clifton, N. Y.

E. H. B.

Poisoning from Rhus.

To the Editor of GARDEN AND FOREST:

Sir,—My experience coincides with that of the writer in your issue for October 2d. I have twice been severely poisoned by *Rhus Toxicodendron*. After the first poisoning it was seven or eight years before the effects of the poison ceased to appear year after year. I still have an annual recurrence of the trouble from the effects of my last poisoning, although with a decreasing severity each year.

Philadelphia, Pa.

O. W. Spratt.

Recent Publications.

Synoptical Flora of North America. Vol. i., Part i., Fascicle 1. By Asa Gray and Sereno Watson; continued and edited by Benjamin Lincoln Robinson. American Book Company, 1895.

This work, a synoptical description of the plants of North America north of Mexico, was planned by Asa Gray. In 1878 he published part i. of the second volume, comprising the gamopetalous orders after Compositæ, and in 1884 part ii. of the first volume, including the Gamopetalæ, from Caprifoliaceæ through the Compositæ. During the last years of his life he was engaged upon the earlier polypetalous orders, and at the time of his death, in January, 1888, he had finished several of the orders before Leguminosæ. After Dr. Gray's death the work was continued by Dr. Sereno Watson, who prepared the manuscript of eleven genera of Cruciferae, including several of the largest and most difficult groups of the order. In 1892 Dr. Watson died, and the continuation of the work was entrusted to his successor in the curatorship of the Gray Herbarium, Dr. Benjamin Lincoln Robinson, who now publishes Fascicle 1 of Part i., Vol. i., including the polypetalous orders from Ranunculaceæ to Frankeniaceæ in 208 pages.

The present instalment of this great work follows its predecessors in form, the orders elaborated by Dr. Gray being printed from the manuscript as he left it, with little change, additions, whether of extended range, new synonyms or bibliographical references, being added in foot-notes. All questions of nomenclature have been treated with the greatest conservatism; and those botanists who dislike reforms in nomenclature will find new comfort in this work, while those who are laboring for a stable nomenclature will regret the differences of opinion among the working botanists of the country, which it only too clearly makes evident. But whether the names of the plants in this work are selected according to a rule or to suit the fancy of individual botanists is a matter of small importance in comparison with the completion of this work; and this instalment will be received with the greatest satisfaction by the botanists of all countries.

A comprehensive Flora of North America has long been needed, and the absence of such a work has proved a serious hindrance to the study of our botany. Apart from its value, however, as a descriptive account, in convenient form, of the plants of one of the great divisions of the earth's surface, the completed *Synoptical Flora of North America* will be the best monument his successors can raise to the memory of the great master of American botany, whose life was spent in preparing for this work.

Notes.

Since the drought has been broken late-flowering varieties of Tamarisk are putting out new flowers, which are of a deeper and more attractive color than the earlier ones were.

Under a law passed by the last session of the Legislature of Rhode Island the state is directed to construct a sample half-mile of good road in any town which petitions for it and will pay one-quarter of the cost. Fifteen towns have asked for such object-lessons, and it is hoped that by this means the movement for improving the quality of the public highways of the state will receive a new impetus.

A woman in Brooklyn who visited the grave of a deceased relative in Cypress Hills Cemetery, some months ago, alleges that she was poisoned by *Rhus Toxicodendron* which had been allowed to grow in her lot. She has sued the cemetery association for \$10,000 damages on account of the sufferings which she has since endured. This gives rise to some very interesting questions as to the responsibilities of corporations who control cemeteries.

The sidewalk flower-stands are again gay with Chrysanthemums, and the superb masses of color they make justify the popularity of the flower, and make it safe to prophesy that it will long retain its place against all rivals as the Queen of Autumn. Marion Henderson in early October was the leading yellow variety, its even size, stiff stems and healthy leaves making it one of the most desirable of the early sorts; Madame Bergmann was the earliest of the good white varieties, while Merry Monarch was only a few days later; Marquis de Montmort is a good pink, which was in market here on the 30th of September.

An interesting plant lately received at the Horticultural Department of Cornell University is *Eleusine coracana*. It belongs to the Grass family, but is unknown in a wild state. It is supposed to have come from *Eleusine Indica*, the common Crab Grass of dooryards, although it differs from this plant greatly in size, being four feet high, and in the appearance of its seeds, which are smooth instead of being wrinkled. The plant is known in China and India as Natchnee and Mandua, and thousands of acres of it are grown in those countries and in Japan, where it is a famous food-plant, the flour from the farinaceous seed being made into bread. A form of it is also in cultivation as an ornamental grass.

Bulletin No. 30 of the New Hampshire Experiment Station gives a full account of the methods and cost of macadamizing a section of a country road. Illustrations show the methods of construction at various periods, and there is an itemized account for grading, ditching and surfacing. The directions are full and complete, and the little pamphlet ought to have a genuine practical value in country districts where good road engineers are scarce. In regard to repairs, the following sound advice is given: Men should be employed in each section of the town to make all necessary ordinary repairs and surfacing, not once or twice a year, but as they are needed. Nothing is so costly as to allow a good road to go to pieces for lack of timely attention.

Three-fifths of the oil of peppermint consumed in the world is produced, according to the Detroit *Tribune*, in eight counties of Michigan. The oil product of that state this year will amount to 150,000 pounds, and between twelve thousand and fifteen thousand acres are devoted to the cultivation of Peppermint. Frost and drought have injured the older plantations this year, although the plants set this spring have escaped injury. The peppermint is cut when in blossom like hay, and when dried is placed in wooden vats and steamed until the cells burst and the oil passes upward with the steam, which is condensed and conducted into a reservoir where the oil rises and is skimmed off. It requires 350 pounds of dried peppermint to produce one pound of oil. An acre of land will yield from six to ten pounds, and in exceptional cases even as great a quantity as fifty pounds. This year the price has ranged from \$1.60 to \$1.70 a pound.

In speaking of shrubs which resist the drought and heat, Mr. Joseph Meehan writes to the *Country Gentleman* that *Caryopteris mastacanthus* carried its blue flowers in great profusion, while its foliage looked fresh and clean well into October, in spite of the fact that hardly any rain had fallen in Philadelphia since the fourth of July. We have often commended this plant for its neat habit and for its profusion of bloom late in the season. It will survive the winters as far north as Boston in a dry and sheltered position, but even where it is necessary to lift the plant and place it in a pit to be

kept over until spring, its distinct and striking character is sufficient to warrant this trouble. Even as far south as Philadelphia the extremities of the branches die back every winter. This does not injure the plant, however; but, in fact, makes it more compact, and as the flowers appear on the growths of the current year the more new branches made the more flowers there will be. The plant ought to become common since it is easily propagated from cuttings.

A correspondent of *The Independent* writes that the Jersey Kale, a plant largely used in the island of Jersey as food for cows, has been introduced into California and has shown itself a good forage-plant, as well as a good plant for poultry. It grows very vigorously, and some ranchers in California have stated that it will produce more food to the acre than any other crop which they have tried. The plant in question is really a tall-growing Collard, not essentially different from the well-known Collard of the south, which is popular where Cabbages do not head easily. It differs from the Scotch-Kale in having leaves almost smooth instead of curled. Perhaps it has no special advantages over other members of the Cabbage family, except that with care it will last several years and will grow sometimes from eight to ten feet high if the leaves are pulled off. Even Brussels Sprouts on good California land will often grow four feet high, and it will sprout from the trunk and will give a great mass of leaves if it is cut back several times in the season.

Mr. F. W. Burbidge, writing to *The Garden*, says that, as a rule, there are two or three times too many flowers and plants used in the best of the London parks and gardens. There are too many flower-beds, and these are too near together, so that there is no breadth or repose. One may admire the quantity and variety of exotic plants and flowers employed, but he cannot but be struck with the absence of the best taste in their arrangement and disposal. Palms, Bamboos and Bananas are dotted singly and at equal distances in all directions, so that instead of seeing a series of stately effects or pictures, the result is constant repetition, and one is wearied by seeing the same plants over and over again. The London parks possess also a profusion of flower-beds, but, in nine cases out of ten, half as many plants simply arranged would be more effective. He adds that a good gardener is not always a good artist, and this artistic feeling is what is especially wanted in public gardens, and good and costly materials are more than half-wasted every year because they are badly managed.

Among pears now in season are spicy Seckels from Rochester, New York, at fifteen cents a quart. Showy Comice, the best-flavored of the larger sorts now offered, the large greenish-yellow Easter Beurre, and the medium-sized russet Winter Nelis, all range from seventy-five cents to \$1.00 a dozen for the best. Quinces are becoming scarce, and the best cost in the retail stores \$6.00 a barrel. Among the few peaches still arriving are good specimens from western Maryland and Pennsylvania, and some choice White Heaths, from the Hudson River district. These sell in the fancy-fruit stores at fifty cents a dozen. Selected King apples bring \$5.00 a barrel at retail, and Albemarle Pippins \$6.00. Apples generally are advancing in price, as the European crop is not as large as anticipated, and the high quality of the American crop has been lowered by recent unfavorable weather. The best grades of Alexander and Snow cost, in wholesale lots, \$3.00 to \$3.75 a barrel, and Jonathan and Alexander \$3.00 and upward. Small Lady apples, not yet in their brightest colors, cost forty cents a quart. The showiest objects now seen among the best collections of fruits are the orange-red Japanese persimmons; they cost sixty cents a dozen. Jamaica oranges are being hurried on the market at the beginning of the season for high prices, many of them but half-grown, green and sour. As a consequence, prices are lower and likely to fall below the paying point. There is a steady demand for Alligator pears, and one of the fancy-fruit stores, on the arrival of a shipment of this fruit, sends notice to two hundred regular customers. The fruit at this time is coming from Nassau, and sells quickly from twenty-five to thirty-five cents apiece, and the supply is never as great as the demand. A remarkable sale of figs occurred here last Wednesday, when \$40,000 worth of this fruit was sold at wholesale auction in one hour. Prices ranged from 6 $\frac{1}{2}$ to 15 $\frac{1}{4}$ cents a pound, and on the succeeding day the extremely high price of 19 $\frac{1}{2}$ cents a pound was reached. Thirty-four car-loads of California fruits were sold here last week, mostly Tokay grapes. The last German prunes are now shown and cost seventy-five cents for a package containing three dozen fruits. Extra large-sized chestnuts, from New Jersey, have sold as high as \$12.00 a bushel, and bring forty cents a quart at retail.

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLE: —Special Attractions in City Parks	431
The Floating Gardens of Mexico. (With figure.)	Charles H. Coe. 432
FOREIGN CORRESPONDENCE: —The "Spot" Disease of Orchids.	W. Watson. 433
New or Little-known Plants:— <i>Kalmia cuneata</i> . (With figure).	C. S. S. 434
PLANT NOTES.	434
CULTURAL DEPARTMENT: —Some Good Chrysanthemums.....	T. D. Hatfield. 436
The Meadow Saffrons.....	N. J. Rose. 436
Wintering Aquatics	W. Tricker. 436
<i>Elæagnus longipes</i> , <i>Citrus trifoliata</i>	J. P. 437
Leonurus Leonurus	T. D. Hatfield. 437
CORRESPONDENCE: —Small Conservatories.....	S. A. A. 437
The Chautauqua Grape Belt	L. J. Vance. 438
The Lily, Melompome.	C. L. Allen. 438
Color Bands on the Apple	G. Harold Powell. 439
RECENT PUBLICATIONS	439
NOTES	440
ILLUSTRATIONS: —Boats on La Viga Canal, loaded with vegetables and flowers, Fig. 59	433
Kalmia cuneata, Fig. 60.....	435

Special Attractions in City Parks.

A VALUED correspondent writes to say that in his opinion the view we take of the functions and uses of city parks is too narrow to meet all the wants of the city population. He agrees with us that broad pastoral scenery is especially restful to people whose every-day life is passed within rigid and rectangular city conditions, but after all, people want something more attractive than the beauty of natural scenery to allure them where they can have the benefit of sunlight and fresh air. He thinks, for example, that the menagerie in Central Park is the most useful feature of the park, because the grounds are constantly crowded with children, who would never see the park but for this attraction. He adds that if there is any considerable portion of the population who would be drawn to the park by any floral spectacle, or by games or amusements of any sort, he would introduce these features at any cost. In fact, he would value any adjunct to a park according to its effectiveness in drawing people out of their houses and into the wholesome air.

It would require a long article to make a comprehensive discussion of all these points, but, taking up the first suggestion, it may be worth while to say that if we consider the health and comfort of the animals the present site of the menagerie is bad, because it lacks a sunny exposure, and while the cool sea breezes are shut off from it in summer by a ridge, it lies open to the coldest winds of winter. Besides this, it has neither a running stream nor pond which can be kept fresh, and it has a hard, impermeable subsoil instead of one that is open and easily drained. But suppose the open north meadows offered an ideal site for a zoölogical collection in so far as the health of the animals was concerned, the fundamental objection would still remain that this smiling landscape would better serve the purpose for which the park was originally set apart by the city, than if it were occupied by an attractive collection of animals. It is true that even now the menagerie grounds are often crowded, but a Punch and Judy show, a minstrel entertainment or many other exhibitions would draw still greater crowds and cost less money. If it were the primary purpose of a park to furnish the people with different forms of amusement it would have been cheaper at the outset to have taken many small spaces in different parts of the city

instead of one large area in the centre of the island. Sixty small amusement parks, each one covering two city blocks, could have been distributed throughout the city, and they would have covered no more land than was taken for Central Park, and this plan would have required little closing of streets or interruptions of traffic.

For amusement purposes alone, then, it would certainly have been unreasonable to condemn for park-space an area comprising more than ten thousand building lots, to shut up twenty miles of streets and to divide the east side of the city from the west as completely as if a river flowed between them. The only justifying reason for taking so much land in a body was to secure breadth of view and spacious scenery. It is not a fancy, but a recognized truth, that such scenery has a genuine value in helping the dwellers in cities to resist the wearing influences of town life and to recover the mental energy thus wasted. Of course, a rural park furnishes pure air and a space for exercise, but the charm of scenery is its highest value, and it is more or less useful according to the degree in which the rural spirit of the place is preserved and developed. Now, it is possible to conceive of a park which contains open areas sufficiently spacious to give broad landscape effects and yet can supply room in the shelter of the wooded portions around these spaces for a zoölogical collection which might not in any way obtrude upon the scenery. But the open meadow-space in Central Park is scant, and it was gained at enormous cost by blasting out projecting ridges of rock and covering them with soil. Trees were planted on the borders of these openings to give them a refreshing park-like effect, and yet the great defect of the park is its lack of broad, tranquil views. Every rod of open meadow which has been created should be scrupulously cherished. There can be no question that any of the grassy stretches of Central Park are much more useful now than they would be if converted into fields for special amusements, and the park will be better than it now is when the menagerie is moved to some ampler space in one of the new parks north of the Harlem River.

With regard to the general subject it may be said that children's playgrounds and playhouses, provisions for music and skating and boating, as well as for tennis and other games, have been provided in public parks, but where most successful they have been introduced incidentally, and not as essential features, and they have constantly been held subordinate to the controlling motive of the design. In the same way an aquarium or a zoölogical garden or a botanical garden would be well placed adjacent to a park, provided it is steadily kept in mind that the object of a museum and the object of a park are completely distinct, and that it is impossible to combine the two so that they shall have unity of purpose.

So long as this rule is kept steadily in view it is not difficult to add features which may have special attractions. It would not interfere with the scenery, for example, and, indeed, it would heighten its detailed interest if as many as possible of the wild flowers which grow in the region about a park should be introduced in certain of its woods or shrub borders or open spaces. This feature would be of use to students of botany in city schools, and it might inspire the young with a desire for investigation in larger fields. Again, it might add to the attractiveness of some of the smaller meadows of a park if their bordering shrubs were selected with special reference to their flowering season. That is, one opening might present the leading shrubs which flower in early May, and another those which flower two or three weeks later, so that a series of gardens would be coming to their best in succession.

Where there is a great park system, like those of Chicago and Boston, large groups might be made of one shrub or tree which while in flower would be sufficiently conspicuous to attract visitors, and when out of flower they need not interfere with the general landscape-effect. Of course, such a scheme could not be used to any extent in so small a place as our Central Park, although some secluded ravine

might be planted in this way, where it would not offend against the general design. Early in June last year we spoke of the magnificent display made in the Arnold Arboretum by a hundred and twenty varieties of the common Lilac all in flower at once. The collection occupying a wide bed stretched for nearly a thousand feet along one of the principal drives, the color of the flowers being well brought out by the green turf on the slope behind them. In a park system connected by broad parkways we might have a thousand Forsythias massed in one place and a thousand Spiræas in another, so as to make a more striking effect at flowering-time than the same number of plants would if scattered along individually. In a natural landscape one often sees ten thousand Red Buds or Flowering Dogwoods, or Wild Crabs or Hawthorns scattered along the edge of a forest, and, of course, the margins of woods and parks can be treated in the same way. If we had half a dozen meadows in a chain of parks, instead of bordering them with a mixture of all these shrubs we could plant each one mainly with a single kind which would make a striking display at flowering-time. There is nothing inharmonious in the landscape as seen from Roan Mountain, with its foreground of a million Rhododendrons, and it is the mass which gives impressiveness to the picture.

These are a few of the ways in which special attractions could be provided, and many others might be suggested, as, for example, the massing of trees or shrubs conspicuous for the bright colors of their fruit or foliage in autumn, but it must always be borne in mind that refreshment pure and simple—refreshment for body and mind—is the primary office of a public park, and although a pleasure-ground may casually help students in botany or in other branches of science, this advantage, as well as the striking displays which can be provided for different seasons, should be mere incidents that do not affect its fundamental purpose.

The Floating Gardens of Mexico.

THE famous chinampas, or floating gardens, are a never-ending attraction of the City of Mexico, and yet little is known to the general reader regarding these curious places. Contrary to the general belief, the so-called floating gardens of the present day do not float. Many years since, however—in fact, before the conquest of Mexico by the Spaniards—the name was appropriate, for real floating gardens were then common on the lakes in the Valley of Mexico, especially in the immediate vicinity of the city. But when Humboldt visited Mexico (then called New Spain) in 1803, and Abbé Francesco Clavigero (a missionary among the Indians) a few years later, these peculiar possessions of the Mexicans were rapidly diminishing in number; and in 1826 Captain G. F. Lyon informs us that “the little gardens constructed on bushes or wooden rafts no longer exist in the immediate vicinity of Mexico (the city); but I learned that some may yet be seen at Inchimilco.”*

Abbé Francesco Clavigero describes the true floating gardens as follows: “They plait and twist Willows and roots of many plants, or other materials, together, which are light, but capable of supporting the earth of the garden firmly united. Upon this foundation they lay the light bushes which float on the lake, and over all the mud and dirt which they draw from the bottom of the same lake.”†

The common form was a quadrangle, and the average size about fifteen by forty feet, although some of the largest were a hundred feet in extent. Many of the latter contained a small hut, in which the cultivator sometimes lived; one or more trees were also growing in the centre of these largest plots. The earth used was extremely rich, and this being kept in a moist state by its proximity to the water (the elevation above it being not over a foot), the gardens were productive of the choicest vegetables and flowers, including also Maize.

The gardens of the present day are very different affairs. They do not float, but, on the contrary, are composed of strips of solid ground, usually about fifteen by thirty feet in extent, although some are larger. These plots are intersected by small canals, through which visitors are propelled in canoes. They are constructed by heaping up the earth about two feet above the water. Willows, and sometimes Poplars or Silver Maples, also a species of Cane, are often grown along their banks to keep them from washing down. The nearest gardens to the City of Mexico are along La Viga Canal, a public waterway about forty feet in width and of varying depth. Its source is Lake Texcoco (formerly known as Tezcoco), two and a half miles west of the city, from whence it flows to a point near the town and then returns by a circuitous route to the lake. The gardens are located where the ground is naturally low or swampy.

All produce the choicest vegetables, flowers, and not infrequently fruits, in great abundance, embracing nearly every variety grown in the United States, and others unknown to us. Even in the ditches or little canals beautiful Water-lilies often line the way, while many of the plots are one mass of vari-colored flowers, the most common ones being Roses, Pinks, Geraniums, Poppies and Fuchsias. The great variety of shades and the enormous size of many kinds astonish and delight the visitor from more northern latitudes. The Poppies are more attractive than our finest Paeonies; on certain feast days every one wears a wreath made exclusively from these showy flowers.

The quick and luxuriant growth of the products is mainly due to the daily application of water, which is dipped up in gourds attached to long swinging and pivoted poles, and deftly thrown about. It is needless to say that the cultivator never depends upon rain. Some of the plots are occupied by their owners and their families, who live in charming little houses constructed of cane, and surrounded by all their possessions, often including cows, horses, pigs and chickens. La Viga Canal is almost impassable on Sundays especially, and the same may be said of the beautiful driveways along its tree-lined banks; for Sunday in the City of Mexico is the liveliest and, in many respects, the busiest day of all the week. It is the great market day as well as holiday, and a large number of the craft on La Viga (see illustration on page 433) are loaded with produce of every description from the gardens and elsewhere. The visitor to the floating gardens seldom hides his disappointment on discovering that they are stationary, but he never regrets having visited them; indeed, a day spent on the canal and among the chinampas will long be remembered as one of the pleasantest in Mexico.

Little is certainly known regarding the origin of these famous places. Abbé Clavigero says that when the Mexicans were driven from their native country, ages in the past, they were forced to occupy small islands in Lake Texcoco, where “they ceased for some years to cultivate the land, because they had none, until necessity and industry together taught them to form movable fields and gardens, which floated on the waters of the lake. . . . These were the first fields which the Mexicans owned after the foundation of Mexico.” The custom may have originated as above stated, but the following view, founded on a careful examination of some of the oldest works on Mexico, is advanced as the more probable, especially since the Mexicans still retained and cultivated the watery plots after their independence was again established.

For long ages the Valley of Mexico was subjected to devastating inundations. The valley is about sixty miles in diameter, and is surrounded by a continuous wall of hills and mountains. The waters collected on these flow into six principal lakes. The plaza mayor, or great square, in the City of Mexico is elevated a few inches only above the nearest lake—Texcoco. In former times, a prolonged rainy season caused the surplus waters in the other lakes—which have an elevation of from three to thirteen feet above the plaza mayor—to burst their banks and flow into

* *Journal of a Residence and Tour in the Republic of Mexico in 1826*, vol. ii.

† *History of Mexico, 1807*, vol. ii.

Lake Texcoco, which in turn overflowed and flooded the valley. In June, 1629, the date of the last great flood, the city was covered with water to a depth of three feet, and it remained in that state for five years.

The regular fields were, of course, ruined whenever a freshet traversed the valley, and necessity finally compelled

the absence of an enzyme or organic ferment, which would have been due to the presence of fungi or bacteria, this was accepted as evidence of the absence of these organisms."

Experiments were then made with the view to finding if the spot was caused by atmospheric conditions. A young, healthy plant of *Habenaria Susannae* was taken from a tropical house and placed in a temperature of forty-one to forty-five degrees, Fahrenheit, for twelve hours, and minute particles of ice were placed at intervals on the uninjured epidermis of the upper surface of the leaves. Twenty-four hours later the points on the surface of the leaves originally covered by particles of ice were pale in color, and within four days every phase of the disease was to be seen. In fact, Mr. Massee succeeded, within the time stated, in producing a very clear and bad case of spot in a plant which previously was perfectly healthy. This result was abundantly corroborated in the garden. A batch of plants of this same species of *Habenaria*, which had become drawn somewhat in a stove during the excessively hot weather experienced in the early part of the summer, was removed into a cooler house. Within a short time after their removal a spell of cold weather was experienced and the plants suffered a check which resulted in their becoming very badly affected by spot. In the same house were some very healthy plants of several species of *Satyrium*, which, during the warm weather, grew with exceptional vigor, but when the spell of cold weather came they, too,

fell sick with spot.

the people to depend upon floating gardens for a supply of produce at all seasons, and to prevent a famine. These were moored in places where the rise and fall of the lake waters would not affect them. During the period when floods were looked for at any time, these floating patches were very common, but when the city and valley were partially protected by a gigantic canal in 1789 (commenced in 1607*), by which the main overflow was carried off in safety, they gradually disappeared, until at the present time nothing but the pretty name and stationary plots surrounded by water remains to perpetuate an ancient custom.

Charles H. Coe.

Washington, D. C.

Foreign Correspondence.

The "Spot" Disease of Orchids.

IN the September number of the *Annals of Botany* (Clarendon Press, Oxford), there is a paper by Mr. G. Massee, of Kew, on what is known by cultivators as Orchid spot. The nature of this disease, the worst of all the enemies against which the Orchid-grower has to contend, has been a much-debated question among physiologists, fungologists and cultivators, some holding that it was fungoid and infectious, others that it was caused by the punctures of insects, and others that it was solely due to wrong treatment, and was entirely under the control of the cultivator. Mr. Massee's investigations go to prove that the last hypothesis was the right one. He set out with the preconceived idea that the disease was fungoid, and at first his researches pointed in that direction. This theory, however, breaking down, a search was made for bacteria, but with a like result. "Failing to induce the disease in healthy plants by inoculation with the expressed juice from diseased spots, even when introduced under the epidermis, thus proving

Mr. Massee found that a drop of cold water was equally conducive to the formation of spot. He also found, after numerous experiments, that the disease did not put in an appearance unless the fall of temperature to which the plant was subjected exceeded nine degrees, Fahrenheit, below the average temperature in which the plant had previously grown. Tropical plants are much more liable to become "spotted" than those grown in a lower temperature, and this was proved by Mr. Massee's experiments, which again agrees with the experience of cultivators. The only exception that occurs to me is the genus *Masdevallia*, the species of which are almost entirely grown cool, but which are rarely free from spot. Still, experience goes to prove that in their case excessive moisture, particularly at the root, is most conducive to spot. The healthiest collections are those where the plants are allowed far less water than they are popularly supposed to require.

The following extract from Mr. Massee's paper is important as showing that spot generally attacks the younger leaves at a time when they are in active growth: "Irregularity in the appearance of the spot in different specimens of the same species, even when conducted under precisely similar conditions as to temperature, showed that some other undetermined factor exercised an influence. After repeated experiments this proved to be the relative amount of moisture present in the plant. After a pseudo-bulb, with its accompanying leaf, had been removed from a plant and allowed to remain for three days in a dry place, it was found impossible to produce spot by the method mentioned above, whereas with a similar specimen removed from the same plant, and having the pseudo-bulb placed in water at once, fully developed spot could be produced in four days. Similar results were obtained when experiments were made with entire plants; those copiously supplied with water at the root and grown in a high temperature spotting readily; whereas plants in a resting



Fig. 59.—Boats on La Viga Canal, loaded with vegetables and flowers.—See page 432.

*The drainage canal, commenced by the Aztecs, has been greatly improved and only recently finished by the Mexican Valley Drainage and Canal Company, so that all surplus water and the sewage of the city is now completely carried off.

condition, scantily supplied with water and kept in a low temperature, usually resist all attempts to produce spot artificially."

Orchids generally fall a prey to spot in winter and early spring. If the temperatures of the houses are higher than they ought to be at these seasons spot is almost certain to appear upon such plants as *Phalænopsis*, *Vanda*, *Aërides*, *Dendrobium*, and almost always upon the young leaves. Carelessness in stoking or ventilating or copious damping down in damp cold weather are the chief causes of spot at these times, as every experienced cultivator knows. What we did not know, however, previous to these investigations was whether the disease itself was infectious and grew from a very small beginning in spite of all the cultivator could do, and whether, as some held, when once spot attacked a plant it was next to impossible to save it. I am not quite satisfied that the particular form of disease investigated by Mr. Massee is the only one that affects Orchids, and which falls under the same designation. There is a spot-like disease which attacks the stems more than the leaves, and which may often be traced from the base upward. There is also that "galloping consumption" into which Cattleyas of the character of *C. Dowiana* and *C. Hardyana* fall, changing within a week from apparently quite healthy plants into black watery masses as though they had been boiled. I suppose Mr. Massee will say that the ordinary spot which attacks Orchids, like influenza which attacks mankind, is not the only form of disease which may spring from a chill. Cultivators generally will be grateful to him for clearing away the doubt and mystery in which Orchid spot had become wrapped. We know where we are now, at any rate.

Mr. Massee summarizes his observations as follows: The Orchid disease known as spot is of non-parasitic origin, the initial cause being the presence of minute drops of water on the surface of the leaves at a time when the temperature is exceptionally low and the roots copiously supplied with water.

The effect of the chill produced by the drops of water under the above-mentioned conditions is to cause plasmolysis of the cells of the leaf underlying the drops; this is followed by the precipitation of tannin and other substances, and eventually the complete disintegration of the cells.

Spot, in the broadest sense of the term, which would include the effects of exceptional meteoric conditions on the living parts of plants, more especially the leaves, when growing in a state of nature, is, in the case of cultivated Orchids, mainly, if not entirely, caused by the three following conditions: (1) too high a temperature; (2) too much water, and not sufficient air in contact with the roots; (3) watering or spraying with a falling, instead of a rising, temperature.

The paper is illustrated by colored figures of the leaf of *Eria rosea* and *Bulbophyllum Careyanum*, showing the cells and their contents and the process of development of the disease.

London.

W. Watson.

New or Little-known Plants.

Kalmia cuneata.

THIS is probably one of the rarest plants in eastern America, and there is no record that any botanist has seen it alive since Nuttall's time until two years ago. It was discovered in Carolina by the French botanist Michaux, who left few plants undiscovered in the region which he explored, and was described in his *Flora Boreali-Americana*. A flower and a leaf of Michaux's specimen are preserved in the Gray Herbarium. In the Herbarium of the Philadelphia Academy of Sciences are two specimens in fruit labeled by Nuttall and collected in South Carolina. The labels give neither date of collection, exact locality, nor the name of the collector. Taken late in the autumn, these specimens show, as Nuttall states in his *Genera of North*

American Plants, that the leaves of this species are deciduous, a fact which every other writer on the genus since Nuttall has overlooked. Nothing more was seen of *Kalmia cuneata* until the winter of 1893-94, when it was found by Mr. W. W. Ashe, of the Geological Survey of North Carolina, who detected it in a Pine-barren swamp between the Cape Fear and Black rivers, Bladen County, North Carolina, about ten miles north-east of Whitehall, a small village on the Cape Fear River.

Kalmia cuneata (see illustration on page 435 of this issue) is a shrub with slender straggling stems, from two to three feet tall. When they first appear the branchlets are bright red or green tinged with red, and are glandular-pubescent; during their first winter they are dark red-brown and slightly puberulous, growing glabrous and darker-colored in their second year. The terminal buds are linear-lanceolate, very acute, covered with loosely imbricated dark red scales nearly a quarter of an inch long, and are more than twice as long as the ovate-acute lateral buds. The leaves are alternate, clustered at the ends of the branches, entire, oblong-obovate, gradually narrowed at the base, narrowed and acute or rarely rounded at the apex, which is usually furnished with a minute mucro, sessile or short-petiolate, and deciduous; they are thin, dark green on the upper surface, pale yellow-green and pilose, with short white hairs on the lower surface, from three-quarters of an inch to an inch and a half long and from a quarter to a third of an inch wide, with stout yellow midribs and obscure primary veins arcuate within the slightly thickened revolute margins, and reticulate veinlets. The flowers, which appear in June, are borne on slender drooping pedicels often nearly an inch in length and covered with scattered glandular hairs, and are produced in few-flowered umbels from buds formed in the axils of the two or three upper leaves of the previous year, and are thus crowded at the base of the shoot of the season. The calyx is orange-green and persistent under the fruit, with ovate-acute lobes. The corolla is slightly folded, light green and puberulous in the bud, and after expansion is from one-half to three-quarters of an inch across, slightly lobed, creamy white, and marked at the base of the limb with a broad light red band. The capsules are slightly roughened, about an eighth of an inch in diameter, and are borne on long slender drooping stems. In the swamp on the Cape Fear River, *Kalmia cuneata* grows in sterile sandy, and often submerged, soil, associated with *Cassandra calyculata*, *Andromeda speciosa*, *Myrica cerifera*, *Ilex glabra*, *Ilex lucida*, *Cyrilla racemiflora* and *Pinus serotina*. During the summer of 1894 it was introduced into Mr. George W. Vanderbilt's Arboretum at Biltmore, North Carolina, where it flowered in June of the present year. For the specimens which Mr. Faxon has figured in our illustration we are indebted to Mr. C. D. Beadle, of the Biltmore Arboretum. The flowering branch is from a plant cultivated at Biltmore.

C. S. S.

Plant Notes.

. *QUERCUS COCINEA*.—The Scarlet Oak always comes into mind with the thought of the splendors of our autumn forests. No other American tree flames into more brilliant color or retains it longer than this Oak, which often is in full glow after the leaves of its companions have fallen, and not infrequently its scarlet tints are retained until the ground is white with snow. The tree, however, is beautiful at all seasons of the year. At its best it is seventy or eighty feet high, with a trunk two or three feet through, comparatively small branches and a somewhat open head, so that it has not the appearance of rugged strength which characterizes some other Oaks. It has a certain grace of outline, however, and its thin glossy leaves and dark smooth bark are distinct and attractive. It is not so commonly planted in pleasure-grounds as the Pin Oak or the Red Oak, but it can be moved without difficulty; it will grow rapidly on thin light soil, and it makes an admirable street tree.

SPIRÆA THUNBERGII.—This useful shrub is well known in gardens, and we speak of it now simply to call attention to its singular beauty at this season. It is one of those foreign

S. Thunbergii, which has just begun to take on its delicate rosy-pink hue, which later on may turn to orange. The plant holds these colors, too, later than any other of the genus, and before its leaves have all fallen in November its small white flowers often open. It is needless to add that the plant is covered with its delicate little flowers early in April, that its fine light green foliage is especially graceful, that its habit is good, that it is easily propagated, so that, altogether, it ranks as one of the most useful of shrubs.

KNIPHOFIA ALOIDES (TRITOMA UVARIA).—There are few plants more beautiful and effective than this; it is unaffected by the dry weather, and flowers during a time when there are comparatively few really attractive flowers. The tall spikes rise to a height of nearly three feet; the long, tubular scarlet flowers with crimson segments are collected in a dense spike, and make a striking picture. The long, narrow, deep glossy green leaves in dense tufts are also ornamental. The roots are fleshy, enabling the plant to withstand drought, although it thrives best in rich moist ground. Bold masses of its foliage and flowers are very effective in large grounds on the borders of shrubberies or isolated nearby on the lawn. For the cottage garden, where only a few herbaceous plants can be had, this one is, perhaps, the best one for autumn flowering.

COREOPSIS DELPHINIFOLIA.—Although one of the smallest members of this beautiful genus, this species has great value as a decorative plant. It grows to a height of ten or twelve inches and measures often as much across. It is very bushy, and produces innumerable small heads of pale yellow flowers in August and September. The leaves are small, three-parted or linear and smooth. The heads are produced in leafy corymbs, and measure about an inch across. It grows in dry barren soil, and is a typical plant of some of the poor sandy districts of the south. Like all the Coreopsis, it is easily increased by seeds. This is a most useful plant for naturalizing in large parks and grounds where rocky and gravelly soil abounds. It will add life and color to the landscape without obstructing the scenery in any way.

BEGONIA EVANSIANA.—New hybrids and varieties of Begonias are raised every year, but few of the later introductions can surpass this old and beautiful species. Introduced from Japan or China early in the century, it is now comparatively rare in cultivation, although it is one of the best and hardiest kinds. It is a graceful, shrubby plant, growing to a height of about two feet, with large obliquely cordate, acuminate leaves, slightly lobed and coarsely dentate; deep green on the upper surface, with reddish veins, and red on the lower side. The stem is slender, with reddish swollen nodes. Male and female flowers are produced in drooping, axillary cymes from the same axis, on slender peduncles. The male flowers measure fully an inch across, having well-developed petals and a large cluster of yellow anthers. The ovary of the female flower is large, oblique, three-winged, with two petals well developed and the two inner ones sometimes wanting or rudimentary. Stigmas large, spirally twisted, yellow. The flowers appear early in September and remain beautiful a long time. The species is very floriferous, and the handsome, rosy flowers sometimes cover the plant entirely. It is one of the very best of Begonias for bedding. The bulbs endure the winter as far north as Washington, and in vol. i. of this journal Professor Massey wrote of a bed of these plants in northern

Maryland which came up strong in the spring after enduring a temperature of eighteen degrees below zero.

SPATHIPHYLLUM COMMUTATUM.—This ornamental stove-plant, nearly allied to the Anthuriums, is an elegant species, growing to a height of about two feet and flowering quite



Fig. 60.—*Kalmia cuneata*.—See page 434.

plants whose foliage colors even more brilliantly than that of our native plants. Indeed, our own Spiræas have little autumnal beauty, and do not approach in delicacy or richness of color some of the Asiatic species like the old-fashioned *S. prunifolia*, which is now a brilliant scarlet, or

freely. The ovate-oblong leaves on erect, slender petioles are deep green and membranous in texture. The spathe is flat, oblong-lanceolate, pure white and showy; the spadix is cylindrical. Grown in company with *Anthurium Scherzerianum* this is a very appropriate and useful plant, the white flowers contrasting beautifully with those of the scarlet *Anthurium*. This genus contains several other very ornamental plants, such as the pure white *Spathiphyllum candidum*, the large-flowered *S. cannaefolium* and *S. floribundum*, all dwarfer and more compact in habit than the present one. Some of the species are very fragrant. All thrive in a soil composed of equal parts leaf-mold and peat, with an admixture of some dried cow-manure and broken pieces of charcoal. They should be grown in a moist and warm atmosphere and partially shaded.

Cultural Department.

Some Good Chrysanthemums.

CHRYSANTHEMUMS at the Waban conservatories, Natick, Massachusetts, were never better than now. Some of the finest cut blooms ever exhibited in Horticultural Hall, Boston, came from this place last season. All the best standard varieties are grown, and all reputable new ones are tested. It is a good place to compare notes.

The variety H. L. Sunderbruck still holds first place here among early yellow sorts. In richness of coloring no other variety, except Golden Wedding, approaches it, and when in mass it fairly dazzles the eye. It is a charming flower of regularly incurved form when at its best; and when, later, a few florets undress, it is to many people still more attractive. One seldom sees E. Molyneux in its best form. Its grand, irregularly incurved, crimson and gold blooms are considered indispensable on the exhibition boards in the old country, and no dozen could expect to win without it. It is the one variety above all others which shows the cultural skill and patience of British growers. Cuttings are taken some time in December. The first break occurs in May, and the second from the middle to late August, from which a crown-bud should arise to give a perfect bloom. These are all considerations of importance. A crown-bud started too early will give a malformed bloom of poor color; if started too late an unfinished bloom will follow. Cuttings struck in March in this country will, with generous treatment, reach the first-break stage in May, and from this time forward the methods of culture are essentially the same as pursued with ordinary varieties, taking the August crown.

All lovers of Chrysanthemums are enchanted with the variety Mrs. Henry Robinson. It was raised by Pitcher & Manda some years ago, who apparently did not realize its value. An English grower and introducer, Mr. H. J. Jones, of Lewisham, London, discovered its worth and reintroduced it to the United States last season. It is, without doubt, in habit, size and form of flower and in purity of color, the finest early white variety ever raised. It is a loosely, yet perfectly and gracefully incurved bloom of the largest size. Sunrise, as an early crimson and gold variety, is destined to hold an important place. It is, so far, the first early variety of its color which every one can grow, being good on all buds. It is evidently derived from E. Molyneux, and, though a grand flower, it lacks the finish characteristic of its prototype. Mrs. M. J. Parker, Jr., is correctly named the pink Ivory, being the perfect counterpart of that flower in all but color. Nemesis is another early pink variety of dwarf habit. The flower is of better build, being neatly incurved, but less firm in texture, and on that account may not carry as well or last as long when cut. J. H. Troy, as an early white, is likely to be a leading sort; so also Philadelphia; but with Mrs. Henry Robinson fresh in my mind's eye it is hard to do them justice.

T. D. Hatfield.

The Meadow Saffrons.

LAKE in autumn, when everything else is going to rest, the Colchicums, or Meadow Saffrons, begin to open their buds in woods and gardens. One species, growing wild in sheltered woodland meadows in middle Europe, is as remarkable for the quaint beauty of its flowers as for the tardiness of their appearance. It is commonly cultivated in the cottage gardens all over the Continent and in England, and forms a pleasing feature of the late autumn scenery when growing in masses in sheltered positions among the fallen leaves.

The best and most natural position is a rather low and shallow lawn that will remain sufficiently moist during the summer, for, although flowering so late, the plants are doing their best in the way of growing from the earliest spring. All Colchicums should be planted rather deep, four inches, or even more, in dry locations. A sandy loam, enriched by plenty of well-decayed horse-manure, is preferable to any other soil. It is best to plant them in irregular masses in the lawn, where they may push up among the grass. For this purpose the sod of the selected place should be carefully removed, the soil, if unsuitable, dug out to a depth of a foot or more and replaced with fresh suitable soil, which should be trodden down firmly so as to leave the lawn in a proper condition after finishing the work. The large, egg-shaped bulbs should then be planted deep and firmly, the mass thickest in the more central parts and gradually thinner toward the edges, so as to make a natural appearance when in flower. After planting, the lawn can again be leveled and sodded.

It is not necessary to make regular beds; the plants will do well in the grass, but borders and open spaces in shrubberies may also be utilized, although they will there generally be hidden from view or covered with leaves.

Some of the species, *Colchicum Parkinsonii*, for example, are curiously colored, the white petals being marked with regular purple spots like squares on a chess-board. *C. autumnale*, the common species, throws up large masses of light purple flowers, four inches high above the ground. *C. speciosum* is the largest, producing immense flowers of a purplish-crimson color. There are also double-flowered forms, but these are not as desirable as the single ones. The autumn-flowering Colchicums are entirely leafless when flowering in October or November, the last vestige of the summer foliage having dried up long before.

Newark, N. J.

N. J. Rose.

Wintering Aquatics.

AQUATICS are increasingly popular, and no garden is considered complete without some representatives, if only one or two tubs compose the water-garden. These small efforts are often the beginning of much pleasurable experience and permanent love for these plants. The advice has often been given to store the tubs in a cellar, but hardy varieties and tender varieties need different treatment. Hardy varieties will do well in a cold cellar if it can be kept at about thirty-five degrees, Fahrenheit, and not above forty degrees; but the trouble is to find such cellars, for in most cases they get warmer as spring approaches, and the plants start into growth before it is safe to put them out-of-doors. Such growth will not stand exposure to the light and air, and the plant is weakened and may not start again for some time, and then only feebly, with disappointing results. The greatest care is necessary to keep the plants dormant until it is safe to put the tubs outside in the spring. One of the safest methods of wintering hardy *Nymphaeas*, and *Nelumbiums* especially, if the tubs are plunged in the ground, is to leave them there, place a large box or frame over each tub, fill it with leaves, fern or salt hay, cover this with a shutter or boards and secure the same against storms and high winds. Before covering the tub it should be filled with water and a piece or two of board placed over it to keep the leaves out. If two or more tubs are in use they should be set together, thus making one covering and protection suffice. If the tubs have to be moved to some spot for protection, a warm, sheltered one should be selected in front of a greenhouse or other building, with a few boards. Snug winter quarters may easily be contrived, and if a hot-bed sash can be utilized it will afford much protection against frosts in spring, besides lengthening the season three to four weeks.

A good tank for growing aquatics is one made of brick and Portland cement, or concrete, finished with Portland cement, of a size that can be conveniently covered with a hot-bed frame and sash in winter. With a lining of leaves or stable-manure, salt hay or the like, this will prove satisfactory. It will be necessary to examine the tank during mild spells, especially as spring approaches. The amount of covering will depend on the severity of the weather. Such tanks, with frames and sashes for winter protection, and with some heat, will save the plants from injury by the first cold snap and keep them in flowering condition for a considerable time. In the spring, growth will commence some weeks before any start is made in exposed tanks.

If the tanks can be fitted up with a hot-water pipe the plants of the tropical varieties can be had in flower throughout the winter; but such tanks are not suitable for all purposes and places. If the tank or artificial pond is of irregular shape some protection will be necessary to prevent the masonry from

cracking. This attention is even more important than that required by the plants, as in most cases the water is sufficiently deep to prevent the plants from freezing. This is the best way to winter the hardy varieties, provided the masonry is not above the ground-level; in that event it is safer to remove the plants and empty the tank or basin and place a few poles or pieces of lumber across the tank to bear the weight of the protecting material and keep it out of the water. On this, old lumber should be laid near to the edge and projecting about two feet beyond the tank. Above this cover leaves should be heaped and the ground also covered about two feet from the tank with a thickness of twelve to eighteen inches. On these leaves there should be a covering of salt hay or fresh stable-manure to keep them in place, and branches should be laid over the whole to hold the covering against winds. This protection can be regulated according to the severity of the winters in different sections of the country.

Tender *Nymphaeas* may be wintered in a warm cellar, but to avoid the inconvenience of moving the tubs when full of soil the plants may be taken out of the tubs, cutting off a quantity of the largest leaves and roots, and putting the same in pots just large enough to conveniently hold the plant. Several plants can be put into one tub in this way, and will finish their growth and ripen the tubers, which may then be placed in pots of sand and stored away until wanted in spring. Give the plants all the light possible until they die down. The tubers should not be allowed to dry, although they should not be put into water until it is intended to start them. If a greenhouse is available, the tubs can be stored away under the benches, and the plants can be brought forward much better and earlier in the spring.

Riverton, N. J.

W. Tricker.

Elæagnus longipes.—Although this shrub has attracted not a little attention in recent years (see GARDEN AND FOREST, vol. i., fig. 78), it has not come into such general use as its merits would warrant. It is, however, planted more and more every year. The shape of the shrub, together with its curious leaves, gives it a distinct value for ornamental planting. It is of a low-growing, rather spreading habit, with dark reddish-brown twigs, which are thickly coated with small scales. The leaves are very attractive, being of a heavy texture with a dark green upper surface, while the under surface is of a glistening silvery shade, sparingly dotted with small scales similar to those that occur on the branches. It bears an abundance of bloom in May, but the flowers are small and unattractive. The berries are as large as the smaller cherries, but are more oblong in shape. The skin is of a dull brownish-red color, covered thickly with the small scales similar to those that are found on the branches and leaves. The pulp is sweet and pleasant, but the skin is somewhat astringent. Each fruit contains a single conical-ribbed seed. The berries ripen in July and are produced in great abundance, but they would add more to the attractiveness of the shrub if they were less dull in color and were not partially hidden by the leaves. Some writers have advocated the extensive planting of the *Elæagnus* for the sake of its fruit, but its value for this purpose remains to be demonstrated. With proper attention to cultivation and selection there would seem to be no reason why a strain of it could not be secured which would be useful for its fruit. It already possesses two desirable qualities, namely, productivity and hardiness. Plants received at the Experiment Station in 1892 have made good growth and are now in excellent condition, though they have received no protection in winter. The plant is propagated either from seed or by cuttings.

Citrus trifoliata.—While this member of the Orange family has not come up to the expectations of some growers as a hedge plant for the north and west, yet it is of interest to note that a plant received at this station in 1892 is still alive, though it has had no protection. It makes a sturdy growth each season of about three feet, which is as regularly killed back to the snow-line in winter.

Experiment Station, Geneva, N. Y.

J. P.

Leonotis Leonurus.—Last autumn a spray of a plant with labiate, orange-red blossoms was brought to me for identification. I set it down as a near relative of the common garden *Salvia*. I have since found it to be *Leonotis Leonurus*; the Lion's Tail plant, a native of the Cape of Good Hope. It is not a new plant, having been introduced to European gardens in the early part of this century, and a few years ago was offered by Peter Henderson & Co., of New York. It was quite largely disseminated at the time, but is now scarce in northern gardens. As it will endure a few degrees of frost and is a vigorous plant it may be common in southern gardens, where

a friend tells me he has seen it under the name of the Devil's Paint Brush. Gardeners who have grown it tell me they never succeeded in getting it to bloom. Whether it be the season or the haphazard treatment accorded, it certainly has done well with me, and is now blooming quite freely in a dug-out garden frame. It has a distinct Sage-like appearance, and casually might be taken for a *Salvia*. The flowers, however, are not borne in terminal clusters, but in whorls, as they occur in the genus *Phlomis*, to which it was at one time referred. Cuttings were struck early in December, and the plants grown to a goodly size, though starved, in four-inch pots. When the month of May came they were planted out in the regular order, and made bushy plants three feet high and as much in diameter. Some were topped and others untouched. These latter have bloomed best, showing, as my friend suggested, that a good foundation of solid growth is needed in order to have the plant flower well. In lifting such plants it is difficult to get any considerable ball of earth, and it is well to have pots at hand to drop the plants into. After a few days in the shade of a Pear-tree our plants soon established themselves, with the loss of very few leaves.

Wellesley, Mass.

T. D. Hatfield.

Correspondence.

Small Conservatories.

To the Editor of GARDEN AND FOREST:

Sir,—I have lately inclosed one of my piazzas, facing south, with glass, and propose to use it as a winter garden or conservatory for a miscellaneous collection of flowering and decorative plants, most of which have been transferred from the borders and are now in pots. I suppose that the surplus heat from the dwelling, with the help of an oil-stove, will keep out any frost likely to occur in this latitude, so that with the sunny exposure I shall have no trouble from lack of warmth. But I have often noticed that plants in such places wear anything but a happy look, and I should like some hints on managing a winter garden of this sort.

Lebanon, Pa.

S. A. A.

[Our correspondent opens up a subject which will be of interest to many, as such inclosures are often the most available as well as the cheapest arrangements for wintering plants where they may be enjoyed. Often they are not enjoyed for the reason that their wants are not understood and they fail to grow. The cultivation of the large majority of plants out-of-doors is a comparatively simple matter. Nature supplies most of their wants so long as they are not under artificial conditions. But when they are under shelter then their wants must all be anticipated and met. It is too often forgotten that the leaves are the principal assimilating organs of plants, and as the carbon which they absorb occurs in air in very minute proportion they require a great abundance of that element. Water is next needed to dissolve the food they take and fill their tissues. Without warmth and light no plant activity is possible. Hence, we have the simple problem to provide an abundance of pure, properly warmed air with liberal but not too great a supply of water. The first requisite in an inclosed garden is sufficient energy in the way of heat to keep the water moving and the fresh air warmed up. Too many, like our correspondent, trust to makeshift arrangements, which, while they may suffice to prevent freezing, yet fail to supply sufficient heat energy. In cold weather it is, therefore, necessary to close all ventilators, so that the air is devitalized and the soil in the pots becomes cold and perhaps sodden with stagnant water, under which condition the best-intentioned plants cannot grow, for there are many cloudy days and one cannot rely on sunlight. A small heater, which may be placed in the cellar, with two or more pipes in the conservatory for hot-water circulation, is the best method of heating such structures. These heaters are now cheap, and burning slowly at ordinary temperatures they consume comparatively little fuel. In fact, they are more economical than oil-stoves, to say nothing of their freedom from danger and offensive and destructive vapors. Ample ventilation should always be provided in plant-houses, and while plants do not like draughts, they do not mind fair amounts of fairly cold fresh air if they have not been unduly forced and made

soft in tissue. It is usually better to waste heat through an open ventilator than to keep a house close and lifeless and breed thrips. The proper temperature of a greenhouse will depend on its contents and on the season. With the usual amateur collections it is best to keep the temperature rather low till the end of the year, thus allowing the plants to slightly rest, and gradually increase the heat as the days lengthen. It requires much discrimination to properly water plants in pots. No plants should ever be allowed to be so dry that their feeding roots are destroyed; on the other hand, a sodden compact soil will prove fatal. It is only by experience in a houseful of plants that one can discover which require frequent and which more rare attention. In winter the morning is the time to water and syringe the foliage. If it is necessary to water late in the day the foliage should not be wet or the house made too damp, otherwise, with declining temperature, water on the foliage will develop fungus or spot on many leaves, which is as fatal to the leaf-cells as it is to the beauty of the foliage.—ED.]

The Chautauqua Grape Belt.

To the Editor of GARDEN AND FOREST:

Sir,—The largest strip of territory devoted to the cultivation of table grapes east of California and the Rocky Mountains stretches from the hills surrounding Chautauqua Lake, in New York state, to the blue waters of Lake Erie, and then along the shores of Lake Erie for a distance of about one hundred miles.

The Chautauqua Grape belt, as it is called, comprises the vineyards of Chautauqua County, New York, and of Erie County, Pennsylvania. There are in this belt about 20,000 acres of vines. The rapid growth of viticultural interests in this section of the country will come in the nature of a surprise to most people. The industry dates back some twenty-five years, but the greatest progress has been made within the last fifteen years. The statistics of 1890 show that there were 9,180 acres of bearing vines and 1,620 acres of non-bearing vines, making a total of 10,800 acres of vineyard in the Chautauqua belt. Since then—that is, in only five years—the acreage of vineyards has increased one hundred per cent. There is some question whether the census of 1890 was complete, for, according to figures furnished by Mr. George C. Snow, of Penn Yan, who was Superintendent of Viticulture at the World's Fair, a thorough canvass of the Chautauqua district in March, 1893, showed that there were 17,624 acres of bearing vines and 7,500 acres of non-bearing vines, making a total of 25,124 acres of vineyard. It may be here stated that the vineyard acreage of the Chautauqua belt has been at a standstill, or decreased, during the past two years, owing to the low prices for grapes and the general unsatisfactory condition of the market.

In the early years of the Chautauqua industry the growers made large profits. Then the grape crop brought from three to four cents a pound, or from \$60.00 to \$80.00 per ton. Many vineyards yielded three tons to the acre, and some as much as four tons. Even at \$60.00 a ton, the Chautauqua grape-growers cleared about one hundred dollars net per acre. A well-known grower at Brockton, who had fifteen acres of vineyard, in one season made over \$1,500 from his crop.

These and other inducements led many people to begin the grape business, and just about ten years ago there was a boom in the Chautauqua belt. The price of good grape land suddenly advanced from \$50.00 an acre to \$150.00, and some of it could not be bought for less than \$200.00 an acre. Farmers who did not make a specialty of grapes had small vineyards of five, ten or fifteen acres. Those who made grapes their chief crop often had from forty to fifty acres of vines. There are several vineyards in the Chautauqua belt of from fifty to one hundred acres. One of the most extensive is that of Garret Ryckman, at Brockton, New York, consisting of over one hundred acres. The vineyards of R. J. Quale and of the Hanover Grape Company, at Silver Creek, are each about one hundred and ten acres in extent.

For some years every one believed thoroughly in grapes. There had been no seasons of failure of the crop, and prices were high. Meanwhile, new vineyards were coming into bearing at the rate of about one thousand acres a year. Elsewhere the acreage of grape land had also increased in the state, especially in the Hudson River and the Lake Keuka districts. The result was that the markets of New York, Boston and

Philadelphia were flooded with grapes. Then came poor yields, together with low prices, and many persons have become discouraged and have abandoned the unprofitable business. This year, with the disastrous freeze in May, will be remembered as one of the worst in the history of grape-growing in the Chautauqua belt. The grape growers suffer from many evils, but principally from overproduction. There is now a surplus of grapes in the market. Almost every week during the shipping season the markets of the large cities break under the pressure, and grapes are often sold at prices that do not much more than cover the commissions and freight.

In good seasons the annual yield of the Chautauqua vineyards is about 15,000 tons, or 30,000,000 pounds of table grapes. To ship this immense crop to market requires about 2,000 cars, and each car holds about 2,500 baskets. The fruit is about equally distributed between eastern and western markets, although during the past three or four years many new markets for New York grapes have been opened in the far west, so that the Chautauqua growers now send their grapes to Chicago, Cincinnati, St. Louis, Omaha, Kansas City, Denver, Minneapolis, St. Paul, and even to Winnipeg, Manitoba. About seventy-five per cent. of the crop is handled by the Chautauqua and Northeast Grape Union, at Brockton. This Union is an organization of the growers of the different sections of the belt. One of the principal objects of the Union is to market the fruit of the members directly, thus saving the commission dealer's profits, and at the same time to have quick returns and prompt distribution of the proceeds of sales. The grapes are graded according to quality, and every shipment is inspected before it is sent to market. The grower is required to place his name, together with the mark of the Union on every basket, and in this way unripe or poorly packed fruit can be traced back to the offender.

The crop is marketed on the coöperative or pooling system. Shipments along the entire belt are pooled daily and weekly, and checks are promptly sent to each grower for his pro rata share. Thus, the fruit is marketed at less cost and at less trouble than would be possible by individuals. The grower is relieved of looking after his shippings, sales and collections. The Union has a large number of traveling salesmen in all the principal markets, and its representatives keep the head office posted continually as to the supply and the prices of grapes at different points.

The bulk of the Chautauqua grape crop is of the Concord variety. The location does not seem suited to the ripening of such late varieties as the Catawba. The shipping season begins about the first week in September, and is practically over after Thanksgiving, or about the first of December. This gives the Chautauqua grower a much shorter range of season than the Lake Keuka grower, who supplies the market with grapes until March or April.

Several systems of training vines are in vogue in the Chautauqua Grape belt. Some favor the Kniffen system, but the majority of growers use the fan system. In the first year the vines are cut back to three or four buds; in the second year they are cut back to five or six buds, and three of the strongest shoots of new growth are left for the bearing arms of the third year. The best two canes are then tied to the wire, and after that each year two or three of the best new canes are trained on the trellis in fan shape.

New York.

L. J. Vance.

The Lily, Melpomene.

To the Editor of GARDEN AND FOREST:

Sir,—On page 427 of your issue for October 23d, Mr. Orpet says: "The kind we have always regarded as the best dark form is known in trade-lists as Melpomene. This is a native of Japan, and in no way connected with the kind raised by the late C. M. Hovey, of Boston, which was a hybrid between *Lilium auratum* and *L. speciosum*." This can hardly be correct, since *L. auratum* was not introduced from Japan until 1860, while Mr. Hovey, who was very successful in raising *L. speciosum* from seed, showed at the Massachusetts Horticultural Society's exhibition in 1853 nine seedlings which he named after the Muses, Melpomene being of the number. This is the only one of the nine now in existence, the others having dropped out because they did not possess characters sufficiently distinct to be noticed by the ordinary observer. That Hovey's Melpomene is identical with what Mr. Orpet considers the best species from Japan, I have always believed, but it is entirely different from the cross between *L. auratum* and *L. speciosum*, which was not produced until about 1870.

C. L. Allen.

Floral Park, N. Y.

Color Bands on the Apple.

To the Editor of GARDEN AND FOREST :

Sir,—A band of bright red or yellow is often seen on the apple, extending from the stem to the calyx. These stripes of color are as perfect and well defined as if laid on by an artist's brush. The cause of this phenomena has never been satisfactorily explained, but the theory most commonly advanced is that color marks are due to the effects of foreign pollen. It is probable, however, that the bands are a form of variegation in the calyx of the flower similar in character to the red bands in the petals of the Carnation or Rose. In the Apple-flower the calyx is united with the ovary, and as the fruit ripens the adnate calyx thickens and becomes the edible portion, while the core, which consists of five carpels, is the true fruit. If, now, the color band was due to foreign pollen, one-fifth of the entire fruit would be affected, but, on the other hand, the color resides only in the epidermis, which is a portion of the calyx. When the causes of variegation are known, then the explanation of color bands can probably be made.

Cornell University.

G. Harold Powell.

Recent Publications.

Blackberries.

Bulletin No. 99, issued by the Horticultural Division of the Cornell University Experiment Station, is devoted to Blackberries. It is written directly for the use of fruit growers in western New York, but it contains much that is of general interest, and we herewith present in a condensed form some of its suggestions and directions.

SOIL.—A deep, mellow, clay loam which contains considerable humus and crumbles rather than bakes in the furrow, is the best for the Blackberry. Open, gravelly lands are too dry, and since the plants need much water it is important to plow all hard lands deep so that the roots can reach permanent moisture. On flat lands with a high subsoil, unless tile-drained, the bushes will suffer in winter and the fruit will be injured by summer droughts. Strong yearling plants from suckers or root-cuttings are best to begin with and should be planted in the spring.

PLANTING.—The plants are set in the furrow six or seven inches deep, two to three feet apart in the rows, which are eight feet apart. This gives space enough for two horses and a spring-tooth cultivator, which is the best means of keeping the plantation in good condition. Potatoes may be grown between the rows the first year, and it is possible by high cultivation to obtain two crops of Strawberries before the Blackberries smother them. Three or four canes should be allowed to grow the first year, and they will bear some fruit the following season. They should be headed back when they reach the height of two or three feet.

TRAINING.—The canes springing from the root one year bear fruit the next, and then their usefulness is ended. These canes can be cut in August or September, or the operation can be delayed to a less busy season, but they should always be cut off before the following spring close to the ground, so that other canes will sprout from the root to take their places. A strong root may send up from ten to twenty shoots, but only a few of them should be allowed to remain, the number being determined by the vigor of the plant, the closeness of planting, etc. Five or six canes will usually suffice, and if the very best fruit is desired this number may be reduced. The strongest canes should be left, the others pulled out when they are four or five inches high, and the superfluous shoots should be removed several times during the season. When the growing canes are two and a half or three feet high a couple of inches of their tips are cut off, and the plantation should be gone over three or four times as the different canes reach the desired height. The vigorous laterals should be allowed to push out and grow their full length and should not be shortened in until the next spring. How much they should be cut depends on various circumstances. Some, like Wilson's Early, bear fruit close to the cane; others should be left longer. Some growers delay the pruning until the blossoms appear, and the laterals are left from twelve to twenty inches in length. As these bear most of the fruit it is important that they make strong, well-matured growth and that the grower shall familiarize himself with their habits. It is important, generally, that the main cane should be headed in early so that the laterals should have time to make a hard growth and

start down low so as to prevent the cane from tipping over with its load of fruit. Plants thus managed will need no stakes or trellises, although a simple wire may be stretched along each side of the row and secured to stakes to keep them from lopping. Along the Hudson River plants are trained after the manner of Grapes on two-wire trellises. The young canes are headed just above the upper wire and are tied to it where they will least interfere with the ripening fruit. The canes may remain on the wires all winter, or they may be laid down for protection and tied securely to both wires the following spring. This necessitates one summer tying for the young canes and one spring tying for the bearing canes. It is not the best practice to tie them to a single stake, as the fruit will be too much massed in the foliage, although Dewberries can be profitably handled this way.

WINTER PROTECTION.—Hardy varieties, judiciously grown and pruned, do not need this in western New York. In colder climates the bushes are tipped over and covered late in fall. One man goes ahead with a round-pointed shovel and digs the earth six inches deep from the roots, a second man places a fork against the plant a foot or so above the ground, and by pushing it and stamping against the roots with his feet lays it over, the third man covers the plant with the earth that has been removed or marsh hay. If the variety is a tender one the whole bush is covered two or three inches deep. Hardy varieties only need a few shovelfuls of earth on the tops of the canes. If frosts are feared they may be left under this covering until Corn-planting time, but the bushes must be watched in spring and raised before the buds become soft and white. This method of laying down the plants costs less than ten dollars an acre, and the slight breaking of roots is no disadvantage. The operators must be careful not to crack or split the canes, and the method should be varied, as the canes of some varieties are stiffer than others.

CULTIVATION.—Surface tillage should be begun early in the spring to preserve the water. If plowed early, a spring-toothed cultivator should be run through the plants every week, especially after a rain, before the soil bakes. After the crop is harvested one cultivation is given to loosen up the ground which has been tramped down by the pickers, say, about the middle or last of August. Frequent light cultivations are the cheapest, because the weeds never get a chance to grow, and little hoeing is necessary. If a patch becomes foul with Thistles or other weeds it is best to mow it over, plow it up thoroughly and crop with Corn for a season. Suckers will come up among the Corn along the old rows, and the next year the plantation will be completely renewed. Stable-manure is the popular fertilizer, although, if the tillage is good, nitrogen will scarcely be needed, so that potash and phosphoric acid can be applied.

YIELDS AND PROFITS.—The year after the planting the yield should pay the cost up to that time, the third year should give a large crop, and since there seems to be no limit of the profitable age of a Blackberry plantation, every good year should give a good crop thereafter. Of course, a plantation will not endure when the land becomes hard and foul or the plants full of dead and diseased wood. A crop of two hundred bushels an acre year after year is possible unless very unfavorable seasons intervene. With good varieties well cared for, the blackberry is one of the most profitable of small fruits, but the golden harvest only comes to those who work for it and think while they work.

ACCIDENTS AND DISEASES.—Frost occasionally injures the crop in western New York when a severe one comes late. The four most dangerous diseases are the red rust, the root gall, anthracnose and cane knot. The first is incurable, and the affected bush should be pulled out and burned as soon as discovered. The same is true of the root gall. The anthracnose is less serious, and can be kept in check by spraying with Bordeaux mixture, but the best treatment is to cut out and burn the old canes as soon as the fruit is off, and examine the bushes frequently for the disease and cut out the diseased shoots. If the patch is seriously affected it is best to mow the bushes off close to the ground in the fall and early spring, clean out the crowns, spray them and start a wholly new top. The treatment of the cane knot is deferred to another bulletin.

Blackberries deserve attention as the last of the small fruits and the luscious dessert of midsummer. They are only luscious, however, when left on the bush until fully ripe and eaten soon after they are picked. The blackberry is not ripe because it is black; it must be soft and drop into the hand when the cluster is shaken to get its full sweetness and aroma. But, since the fruit deteriorates soon after picking, blackberries never get to market in their best condition, and those who want exceptionally fine fruit must raise it in their home garden.

Notes.

At a sale of the plants last week belonging to the late Samuel J. Tilden, at Graystone, the highest price, \$120.00, was brought by a *Zamia integrifolia*. A *Cycas revoluta*, said to be two hundred years old, brought \$62.00.

A large *Paulownia*-tree in Jersey City is now surprising all who see it by its display of flowers. Undoubtedly the long drought ripened up the wood earlier than usual and the recent rains have encouraged the flowers to open now instead of waiting until spring.

Eighty car-loads of lemons, each containing three hundred boxes, have been shipped east from the colony of Ontario, San Bernardino County, California, this year. Since the lemons have averaged \$3.00 a box the growers in that region may be considered prosperous.

A comparatively small portion of the fruit raised in the Netherlands is consumed in that country. According to recent reports from our consuls, something like a million pounds of black currants, three million pounds of red currants and the same amount of gooseberries and cherries are annually sent to England.

Mr. Gerard has sent to this office flowering plants of the Algerian blue *Scilla lingulata* and its white variety. The small flowers cannot be called showy, although, as ten or a dozen of them are borne on a scape three or four inches high, they are bright and interesting, especially since they come later in the season than any other species of the genus.

We have recently seen bulbs of different kinds of Lilies, Hyacinths and Narcissus which were sent to a New York seed-store from the North Carolina Experiment Station. Of course, it remains to be proved that these will force as well as the bulbs imported from Europe, but in size, weight and general appearance they are altogether superior to imported bulbs.

Butternuts and black walnuts are plentiful this year and sell for eight cents a quart, while hickory nuts, of which there is also a good crop, bring ten cents. Bull nuts, the large hickory nuts known to the trade by this name, cost eight cents a quart; their meats are in demand by bakers. Chestnuts are in lighter supply than was anticipated, the scarcity being attributed to dry weather.

About the latest of the Golden-rods to flower is *Solidago Drummondii*, which is usually at its best during the last half of October. The flowers are of a rich deep yellow, and so abundant that the long slender stems often fall under their weight unless they are staked. It is an admirable plant for large decorations, since the flowers are well set off by the abundant dark green foliage. It thrives well in partial shade.

String beans are now coming from South Carolina and Virginia, peas from the section about Norfolk, large bright eggplants from Florida, and okra from Louisiana. The season for northern-grown Lima beans has been nearly closed by recent frosts, and the few which have escaped bring sixty cents a half-peck. During the foggy weather of the early part of the week large quantities of wild mushrooms came from neighboring meadows. They have sold for thirty-five cents a pound.

The Yellow-root, *Zanthorrhiza apiifolia*, is one of the latest shrubs to take on its autumnal glow, but the orange and scarlet of its leaves in early November make it really desirable. In the Carolina mountains it is an undershrub, and, although neither its flowers nor fruit are conspicuous, its neat pinnate leaves and low growth make it useful for the edges of a shrubbery or for covering shaded slopes or in any other position where a low undergrowth is needed.

Professor Bailey says that natural hybrids between the common Blackberry and the Dewberry are common along the roadsides in central New York. The cultivated varieties known as Wilson's Early, Wilson Jr., Sterling Thornless and Rathbun belong to this mongrel class. The plants are characterized by a low diffuse growth, broad notched leaves and roundish oblong fruits, which are sometimes very large. Some of these hybrids have a distinct tendency to root at the tip, as Dewberries do.

California grapes are now at their best as to size and coloring, and in boxes packed with but one kind, or with bands of Flame Tokays, white Muscats and black Cornichons or Mornings, they make a striking display. A few Salway peaches, brought out of cold storage, are yet seen. Large well-grown quinces from California, in boxes containing sixty to eighty fruits, cost \$3.00. Small lots of pomegranates have recently

arrived from Spain. Almeria grapes, as yet rarely seen in the fruit-stores, sell for twenty cents a pound at retail.

According to Professor Taft, winter Squashes are among the easiest vegetables to carry through the season. Trouble is often experienced in preserving them, but one reason for this is that they are left too long on the vine, where they are subjected to frost. Even if not quite ripe it is better to gather them and place them in some sunny spot where they can be covered at night. On the approach of freezing weather they should be carried to the house, and, unlike most other vegetables, they should be stored in the warmest and driest place possible. If one has a furnace and the squashes are packed around it they will keep, even if they were no more than half-grown.

H. L. Sunderbruck is considered the best yellow Chrysanthemum now in season, and the choicest blooms of this variety sell for a dollar apiece in the Broadway flower-shops. Yellow Queen is another favorite of this color now. Marion Henderson, one of the best early yellow sorts, is already past. Pink-flowering sorts have been scarce thus far, Nemesis being as good as any offered. Merry Monarch, now past, was the earliest white Chrysanthemum of the season. With this variety has been offered Mayflower, which, during the past week, was considered the best white sort of all, Mrs. Henry Robinson ranking second and J. H. Troy next in quality. The latter two varieties sold for not more than half the price commanded by Mayflower, good white flowers being in greater demand than those of any other color. The bronzy-red Sunrise and A. J. Drexel are the principal red sorts. The market season, which opened this year September 30th, was a week earlier than last year, when the first shipments were offered here October 6th.

In the basin of the lower Mississippi and in the maritime region of the southern Atlantic states the Liquidambar, or Sweet Gum, is one of the most common forest-trees of low rich lands, where it develops into tall, straight trunks, free from branches, to the height of seventy or eighty feet above the ground. The smooth and satiny wood, however, is difficult to season, and shrinks so badly in drying that the commercial demand for gum lumber has been limited. For special uses, as for example, for door panels, or for veneers in cabinet work, it is utilized to some extent, and in England the clear timber is considerably used under the name of Satin Walnut. Nevertheless, this is in a large measure a neglected wood because of its tendency to warp, which renders it unprofitable for careless dealers and consumers to handle. A recent number of *The Northwestern Lumberman* states that gum logs when quarter-sawed become tractable and reliable. The wood loses in this way its characteristic grain effects, but it still could be finished with a fine rich surface, and it could be largely employed for flooring and other plain use where durability is required. The vast amount of this timber which is still standing certainly makes it worth while to study and experiment with the wood so as to discover how it can be manufactured and dried in the most profitable way.

The last bulletin issued by the Division of Ornithology of the Department of Agriculture is a report on the economic status of the common crow, based on the examination of about one thousand stomachs. These examinations sustain the charges that are brought against the crow—namely: (1) that it pulls sprouting corn; (2) that it injures the corn in the milk; (3) that it destroys cultivated fruit, and (4) that it feeds on the eggs and young of poultry and wild birds. But when the different kinds of food have been reduced to quantitative percentages and contrasted, the injury done by the birds is comparatively slight. The great bulk of the grain consumed is waste corn, picked up here and there, and of no economical value. The destruction of cultivated fruits is also trivial, while the eggs and young of poultry and wild birds amount to only one per cent. of the food of the crow. As an offset to the bad habits of the bird he is to be credited with destroying many noxious insects and injurious animals. About twenty-six per cent. of his entire food is insects, most of them grasshoppers, May-beetles, cut-worms and other injurious kinds. The season of the May-beetles corresponds with the breeding season of the crow, and these insects are the principal food of the nestling birds. After the May-beetles disappear the crows consume great numbers of grasshoppers, and through the autumn these constitute the greater part of the insect food of the bird. The crow also destroys mice and other injurious rodents, so that in summing up the benefits and losses resulting from the food habits of the bird it seems clear that the good exceeds the bad, and that the crow is a friend, and not an enemy, of the farmer.

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLE —Fruit-drying, a Representative Rural Industry.....	441
Professor Buckman and Plant Variation.....	442
An Interesting Experiment in Tree Culture.....	C. A. Dana. 442
ENTOMOLOGICAL —The Columbine Leaf-miner, <i>Phytomyza Aquilegiae</i> . (With figure.).....	Professor W. E. Britton. 443
FOREIGN CORRESPONDENCE —London Letter.....	W. Watson. 444
NEW OR LITTLE-KNOWN PLANTS — <i>Fothergilla Gardeni</i> . (With figure.)..	C. S. S. 446
PLANT NOTES	447
CULTURAL DEPARTMENT — <i>Cattleya labiata</i>	E. O. Orpet. 447
The Germination of Nuts.....	T. H. Hoskins, M.D. 448
Trenching in Vegetable Garden.....	W. N. Craig. 448
CORRESPONDENCE —Frosts and Fruits	Professor George C. Buzz. 448
Doubling of Flowers	G. Harold Powell. 448
EXHIBITIONS —Forestry at Atlanta.....	G. 449
NOTES	450
ILLUSTRATIONS —Leaf of Wild Columbine mined by <i>Phytomyza Aquilegiae</i> , Fig. 61.....	441
<i>Fothergilla Gardeni</i> , Fig. 62.....	445

Fruit-drying, a Representative Rural Industry.

A FEW weeks ago the London correspondent of one of our daily papers gave what he called "a striking illustration of the lack of resource of the British farmer, of whose woes so much has been heard." He went on to say that there had been such a glut of plums in England this year that the price of the best fruit fell to twopence a pound, which did not pay the cost of gathering and marketing, and, therefore, the growers sat down and allowed the fruit to fall and rot. If, instead of this, they had hustled around and dried the fruit they could have had sixpence a pound in a month or two and no fear of a glutted market, since England pays annually two and a quarter millions of dollars for dried plums imported mainly from France.

It is, no doubt, true that if glutted markets were ordinary experiences with British plum-growers they ought to have prepared themselves to face such a probable danger. If, however, this state of things was altogether exceptional, it is unjust to accuse them of lack of forethought and energy because "they did not bustle around and dry their fruit," for, without the proper machinery and the skill which comes from practice, it would have been utterly impossible to dry a large crop of plums in such a way that they would be attractive, palatable and salable. It is very easy for newspaper critics to advise farmers to take up some new branch of agriculture when an old one fails, but the critic hardly realizes how much time and thought are necessary when the entire economy of a farm is to be readjusted. When there is an overplus of milk in the city and farmers are losing money on this product, it is quite easy to advise them to make butter, but this means a revolution in the entire system of farm practice, and it implies the work of years and the building up of a new plant by men who have no capital. In the same way, whenever grain farming or dairy farming becomes unprofitable, the farmer is counseled to raise fruit—that is, to learn a new trade and build up a new business—and if he is not prepared to do this on sight, he is reproached for his sluggishness just as the critic from whom we have quoted sneers at the "ridiculous conservatism" of the English farmer who wasn't ready with evaporators of the latest pattern to turn his plums into dried prunes at a moment's warning.

How to dispose of surplus fruit in times of abundance is,

nevertheless, a serious problem, since it is hard to transport on account of its perishable nature, and still more difficult to keep in eatable condition. It is plain, therefore, that if it can be converted into such a form that it will endure shipping to any part of the world and will keep all the year round, the market for it is practically unlimited. The fundamental problem is how to prepare the fruit in such a way that its palatable and nutritious qualities can be preserved in the cheapest way possible. The canned-fruit industry is an enormous one, but the demand for this product does not increase as rapidly as the demand for dried fruit, principally because the former is much more expensive. Dried fruit sells at about half the price a pound that canned fruit commands, and yet the material in one pound of dried fruit will make six pounds of canned fruit; that is, the fruit itself, when canned, not counting the syrup, costs twelve times as much as the same amount costs when dried. Another reason for the increasing demand for dried fruit is that when cured by the best modern processes it is much superior to what it once was. In California they have learned to prepare prunes so well that large quantities of them are shipped to France, the home of the prune; dried apricots and pears go to Europe by the thousand pounds, while California raisins have practically driven foreign raisins out of eastern markets in this country, and are now exported in considerable quantities. Statistics are not difficult to obtain, but one needs a vivid imagination to interpret the dry figures in such a way that an adequate appreciation of the importance of this industry is secured. But when we think of three million pounds of prunes sent out from the single city of San José in one month, we gain some idea of the magnitude of the business, and we also get an idea of its rapid growth when we recall the fact that eight years ago this city did not take a car-load of dried apricots in a year, while now it eagerly swallows up two hundred car-loads.

But the prunes and apricots and peaches and plums and pears and raisins which are sent out from California by the train-load by no means complete the full supply of dried fruit that is produced in this country. Bulletin 100, which has just been issued by the Cornell Experiment Station, gives an account of the production of one kind of dried fruit in western New York, and from this we learn that a thousand tons of evaporated raspberries are produced in Wayne County alone. Something like five hundred tons more are marketed from neighboring counties, and yet if the visitor should inquire for dried raspberries at any of the retail stores throughout that region he would hardly find a pound. Where, then, do these berries go? Probably four-fifths of them are consumed in lumber and mining camps of the west and on the plains, where fresh fruit is scarce. Very few of them are exported, and yet in cookery—that is, for use in pies, puddings and the like—these dried berries are nearly as good as the fresh ones. It ought to be added that raspberries are also dried to an important extent in southern Illinois and in Michigan, and more recently in Arkansas.

This bulletin gives an interesting history of commercial fruit evaporation in Wayne County, where, in apple-growing communities, nearly every farm has an evaporator of one kind or another, more than two thousand of these machines being in use in this one county. It ought to be remembered that, great as is the product of dried raspberries in western New York, there are more apples dried than raspberries, and after these in their order come peaches, pears, quinces, plums, cherries, currants, potatoes, peas, corn and pumpkins. This great business has grown up within twenty-five years. One little drying machine was introduced there in 1867 by A. D. Shepley, and the right to use it was bought by Mason L. Rogers, who in 1868 planted five acres of black raspberries, with the expectation of drying the fruit. The modern industry and the use of the word "evaporator" did not begin, however, until Charles Alden patented the tower evaporator in 1870. The

original Shepley machine was only capable of drying three bushels of apples in ten hours. Now one of the establishments described in this Bulletin will evaporate three hundred bushels of apples a day, and another one has a capacity of five thousand quarts of berries a day.

It is not our purpose here to describe the various methods of making trays and moving them, or to explain the process of kiln drying, tower drying, steam drying, vacuum drying or air-blast drying with the various elaborate devices prepared to lighten every possible item of labor. We only use this as an illustration to show that it has taken years of experiment and expense to develop this business into its present form, and that even now considerable capital is required and great attention must be given to the plans of building, machinery, storage-rooms, etc., if the business is to be made profitable. The sum of the whole matter is this. Bonanza farmers who sow wheat by the square mile can afford to sell grain at a few cents' profit on a bushel, just as a large manufacturer is satisfied with a small margin of profit because of the enormous amount of his production. Under the growing stress of competition ordinary farmers cannot live on staple products at wholesale prices. But the farmer, to make something beyond wholesale prices, must put special intelligence into his work. He cannot live as his father did on industry and frugality alone. He must be prepared to meet some special want with a special crop, or he must add to one profit as a grower, another profit as a manufacturer by turning his grapes into wine and his plums into prunes, or he must in some way use the machinery of his farm so that it will make something to sell besides the raw material which grows on his acres. This means that he must know more and apply his knowledge to better advantage. After twenty-five years of study and experience the farmers of Wayne County can make a profit with the most approved appliances after they have secured a good crop, and to secure a good crop constant and intelligent care must be exercised from the time the ground is prepared for the young plants until the manufactured product is put on the market in the most attractive form. The farmers of this country as a class are better husbandmen than their predecessors ever were, but they must have a still more thorough education for their work if they are to maintain the commanding position which the great body of tillers of the soil once held in the political and social economy of the country.

James Buckman and Plant Variation.

PROFESSOR BAILEY is in the habit of making five-minute talks before his class in Evolution, and one of his students sends the following transcription from her notes of one of these addresses as worthy of permanent record :

James Buckman was Professor of Agriculture in the Royal Agricultural College of Cirencester, England. He was born in 1816, and died in 1884. In 1863 he left the chair of agriculture in the Royal Agricultural College to go to his farm in the Downs region, where, during the remainder of his life, he was very successful as a farmer, and also wrote a number of books on geology, botany and the like.

A few years ago, while passing along the streets of Lansing, Michigan, where I then lived, I was attracted by a pile of old books which a dealer said he had just received from New York City. Upon looking them over I was surprised to find a small record-book which was written full of an essay upon the "Botany of the Cabbage and the Ruta Baga," and signed by James Buckman. Moreover, I found an entry in the front part of the book to the effect that the essay had been awarded the prize upon the 15th of December, 1852. Just what this prize was I do not know, and I am not able to find any record that the essay was published. It is very likely that it was written in competition for one of the prizes which it was the habit of the Royal Agricultural Society to offer. It is strange how the manuscript ever left Professor Buckman's hands, and stranger still that it should have wandered across the ocean and finally reached my own library.

But there is still greater interest attaching to this essay. I have been telling you for the past few days that Thomas

Andrew Knight, Alexander Braun and Charles Darwin believed that the chief factor in the variation of plants is the augmentation of food-supply; and here I find in this manuscript essay of Buckman's another statement of the same belief, showing that still another observer had arrived independently at the same conclusions. The essay, bear in mind, was written before the appearance of any of Darwin's philosophical writings, and the statement lacks the exactness of later philosophical discussions; yet it is interesting as showing the man's independent belief. The following sentences indicate his philosophy:

"This laying on of cellular tissue is very analogous to the laying on of fat in animals; in a state of nature no animal (except the hibernating ones) carries fat. Plethora is, in fact, a disease, and so it may be termed in the case of plants. A climate and soil well suited to their health, with good food in the shape of plentiful manure of the right description, causes them to grow fat, and by selecting those plants that appear to have the inclination to develop this cellular tissue on any particular structure, and using their seed in soil of the same description, the peculiarity is propagated."

An Interesting Experiment in Tree Culture.

WHEN in Holland last summer I spent a day in the latter part of July, at the request of Professor Sargent, in visiting the Pinetum Schoberianum, or plantations of coniferous trees belonging to Mr. J. H. Schober, on his estate called Schovenhorst, in the town of Putten, some thirty miles north-east of Utrecht. These plantations are very extensive, some six hundred acres, if I remember correctly, being devoted to them, and they contain probably the largest and most complete collection of conifers from all parts of the world, except, of course, the intensely tropical regions, that has ever been brought together. Mr. Edward Downes, the accomplished United States Consul at Amsterdam, accompanied me, and Mr. Schober himself was there to conduct us through the woods and fields. A more charming and intelligent gentleman it would be difficult to find; and, although light showers were frequent during the day, according to the summer practice of Holland, and our host was long past seventy, he led us about with a vigor, energy and enthusiasm which formed the envy of the younger men of the party.

Mr. Schober is a wealthy lawyer of Utrecht, and, like the wise man he is, he has long cherished a passion for the cultivation of trees; and this passion he has directed toward a most practical and patriotic object. In Holland there is a great extent of land that in former ages formed the seashore; and in these dunes the soil remains worthless for agricultural purposes. With whatever crop might be attempted, whether grain, grass or vegetables, the expense would be more than the product, and so the land is substantially left without culture; yet with coniferous trees the case is different. Hence the traveler frequently passes in Holland, as in other parts of Europe, plantations of Scotch or Austrian Pines occupying these sandy lands where nothing else of value could well be made to grow. These plantations cost little, require no care, and by the annual dropping of their needles tend to some improvement of the soil; while at the end of the proper period the firewood they furnish is a substantial thing and always finds a paying market.

In this situation Mr. Schober has struck out from the common course, and, instead of planting *Pinus sylvestris* and *P. austriaca*, he has started to determine what trees are really best worth planting and cultivating in these sands; and for this purpose, as I have said, he seems to have ransacked the whole temperate zone in all the continents. But I cannot do better than to give his list as follows:

<i>Abies amabilis.</i>	<i>Abies concolor.</i>
" <i>magnifica.</i>	" <i>firma (bifida).</i>
" <i>balsamea.</i>	" <i>Fraseri.</i>
" <i>brachyphylla.</i>	" <i>grandis.</i>
" <i>bracteata.</i>	" <i>Gordoniana.</i>
" <i>Cephalonica.</i>	" <i>Mariesii.</i>
" var. <i>Appollinis.</i>	" <i>nobilis.</i>
" " <i>Reginæ Amaliæ.</i>	" <i>Nordmanniana.</i>
" <i>Cilicica.</i>	" " <i>glaucia.</i>

Abies	Numidica.	Pinus	Balfouriana, var. aristata.
"	pectinata.	"	muricata.
"	Pinsapo.	"	Lambertiana.
"	" glauca.	"	Bolanderi.
"	Sachalinensis.	"	Coulteri.
"	Sibirica.	"	maerscarpa.
"	subalpina.	"	excelsa.
"	Veitchii.	"	Monticola.
"	umbellata.	"	tuberculata.
"	Eichleri.	"	Peuces.
Picea	Ajanensis aurea.	Sciadopitys	verticillata.
"	" alba.	Sequoia	gigantea.
"	" cœrulea.	Cupressus	intertexta.
"	Alcoquiana.	"	Lawsoniana.
"	Engelmanni.	"	" alba.
"	" glauca.	"	Nutkaensis.
"	" argentea.	"	thyoides.
"	excelsa.	Retinospora	ericoides.
"	" eremita.	"	obtusa.
"	" Cranstoni.	"	pisifera.
"	" aurea.	"	squarrosa.
"	" compacta nana.	Thuya	gigantea.
"	" pyra-	"	occidentalis.
"	midalis.	"	Hoveyi.
"	excelsa compacta inverta.	"	" pendula.
"	" " Remonti.	"	Japonica.
"	" Finedonensis.	"	Wareana.
"	Jezoensis.	"	Verveneana.
"	pungens.	"	Bodmeri.
"	nigra.	"	gigantea aurea.
"	" doumetii.	"	" Standishi.
"	obovata.	"	Späthi.
"	" Japonica.	Thuiopsis	dolabrata.
"	orientalis.	"	" robusta.
"	polita.	Librocedrus	decurrens.
"	Schrenkiana.	Juniperus	communis.
"	rubra.	"	Virginiana.
"	Khutrow.	"	" pendula.
"	Morinda.	"	" variegata.
"	orientalis aurea.	"	albo spica.
"	acicularis.	"	glauca.
"	Omorika.	"	aurea spica.
"	Glehnii.	"	Japonica aurea.
"	Dicksonii.	"	Schottii.
"	Sitchensis.	"	drupacea.
Larix	Europæa.	"	elegans.
"	Japonica.	"	cinerascens.
"	leptolepsis.	"	sabina.
"	microcarpa.	"	communis aurea var.
"	Kämpferi.	"	Oxycedrus.
Cedrus	Libani.	"	Chinenensis.
"	Atlantica.	"	pyramidalis.
"	Deodara.	Tsuga	Mertensiana.
Pinus	Austriaca.	"	Brunoniania.
"	contorta.	"	Canadensis.
"	densiflora.	"	Pattoniana.
"	Laricio.	"	Sieboldii.
"	" stricta.	"	Caroliniana.
"	" Calabrica.	Pseudotsuga	Douglasii.
"	Thunbergii.	"	pendula.
"	monophylla.	"	argentea.
"	Fremontiana.	"	glauca.
"	montana.	"	Schovenhorst
"	uncinata.	seedling.	
"	Pumilio.	Athrotaxis	Doniana.
"	Pinaster.	"	laxifolia.
"	Brutia.	"	selaginoides.
"	Pyrenaica.	Araucaria	imbricata.
"	sylvestris.	Cryptomeria	Japonica.
"	resinosa.	"	" argentea.
"	Jeffreyi.	"	" falcata.
"	ponderosa.	"	" variegata.
"	Benthamiana.	"	" compacta.
"	rigida.	"	" elegans.
"	serotina.	Taxus	baccata.
"	mitis.	"	" pendula aurea.
"	Tœda.	"	" pyramidalis.
"	Cembra.	"	" cuspidata.
"	" Sibirica.	Widdringtonia	cupressoides.
"	" pumila.	Cephalotaxus	Fortunei.
"	Strobos.	Torreya	Myristica.
"	Koraiensis.	"	" Californica.
"	Sabiniana.	Biota	Japonica filiformis
"	Balfouriana.	"	erecta.

In one of his pamphlets Mr. Schober furnishes an interesting catalogue of plants that are not *winterhaard*, and were much injured or entirely killed by the winter of 1881:

Abies	bifida.	Cephalotaxus	drupacea.
"	firma.	Different	varieties of Cupressus.
"	Pindrow.	Frenela	australis.
"	acutissima.	Pinus	densiflora.
"	Japonica.	"	Fremontiana.
Araucaria	imbricata.	"	ovatia.
Arthrotaxis	selaginoides.	Sequoia	sempervirens.
"	" cupressoides.	Guineana.	Torreya nucifera.
Biota	orientalis.	"	" myristica.
Cephalotaxus	pedunculata.	"	grandis.
"	Fortunei.		

There are several separate plantations of these trees at Schovenhorst, and no two of them seem to be of precisely the same age. The first planting dates back to 1848. The rule universally observed in groves of Scotch Pines, of putting the trees in straight lines at very small distances from each other (from three to six feet apart), has been adhered to by Mr. Schober. This close planting forces the growth upward, and leaves no room for lateral expansion, except where an extra-vigorous tree crowds away its neighbor and seizes the space for itself. Every two or three years the trees are measured and the measurements recorded. The circumference of each tree is taken at one metre above the ground, and its total height in metres is put down, showing how much it has grown since the last previous measurement. According to the measurements recorded for 1892, the tallest tree, an *Abies pectinata*, had then reached the height of nineteen metres, or sixty-two feet four inches, and its circumference was 1.25 metres, or four feet and one and a quarter inches. Next to this was a *Pseudotsuga Douglasii* of 18.50 metres height and 1.48 metres circumference. I saw no record of the later measurements.

But rapidity of growth and ability to resist the climate do not constitute the final test. The last point of all to be determined will be the quality of the wood. For this purpose trees of each kind will be cut down, and when the specimens of the wood are dried, they will be scientifically examined to determine their strength, their power of resistance, their durability and their relative value as fuel. In order to arrive at this final solution of the problem which Mr. Schober has in view, it is his estimate that at least forty years more will be required; and, as he cannot expect to remain as long as that in this world, he proposes to hand the establishment over to the Dutch Government on its promising to take care of the plantations, and to see that the enterprise is carried to its full conclusion.

I was there too short a time to form any opinion as to the comparative prosperity of the different species of trees; yet it was impossible not to see that one of the most thrifty kinds was the Douglas Fir. That variety of the *Picea pungens* known as the *Menziesii Parryana* was likewise very vigorous and promising. I noticed also that none of the Pine family and none of the *Tsugas* seemed to be equal to those two in growth or beauty. Most of the Japanese conifers wore a discouraging appearance, except, perhaps, the *Picea polita*. But I left Schovenhorst with intense admiration for the zeal, the devotion, the scientific knowledge and the indomitable patience of its owner.

New York.

C. A. Dana.

Entomological.

The Columbine Leaf-miner, *Phytomyza Aquilegiæ*.

BOTH last season and this all the Columbine-plants on our grounds were greatly injured and rendered very unsightly by the depredations of this small insect. The adult of this *Phytomyza* is a two-winged fly. It deposits the egg either on or inside of the leaf early in the season; this soon hatches, and the young larva at once begins mining inside the leaf. This year plants showed the attack

as early as the middle of May, and from that time until now (October 11th) nearly every leaf has shown indications of the presence of this insect, from which it may be inferred that there are probably several broods. Young seedlings of *Aquilegia Canadensis* were severely injured, and old plants of other species lost nearly all their leaves from these attacks. In some instances the soft tissue was entirely devoured, and nothing remained but the skeleton of the leaf.

The larva is a footless grub, and one-sixteenth of an inch long when full-grown. During the period of pupation it is fastened to the under side of the leaf. I have observed eight or ten pupæ hanging from a single leaf. As in all dipterous larvæ, the skin hardens at the last moult, and becomes the covering of the puparium. It turns to a dark brown color and shortens slightly. Soon the adult emerges. Probably the insect hibernates in the pupal stage, though I am not aware that its life-history in this country has been



Fig. 61.—Leaf of Wild Columbine mined by *Phytomyza Aquilegiae*.—See p. 443.

fully worked out. The accompanying figure shows a leaf of *Aquilegia Canadensis* containing mines made by this insect.

Probably we have no remedy against these attacks, for, since the insect is inside the leaf, it is out of the reach of all insecticides. The infested leaves can and should be destroyed. Our beautiful hardy Columbines will lose much of their attractiveness if the ravages of this leaf-miner become general.

Conn. Exp't Station, New Haven, Conn.

W. E. Britton.

Foreign Correspondence.

London Letter.

CIRRHOPETALUM ROTHSCHILDIANUM.—This is remarkable for the large size of its flowers, which exceed in dimensions those of such species as the beautiful *Cirrhopetalum Collettianum* and *C. robustum*. It was shown last Tuesday, and obtained a first-class certificate. The pseudo-bulbs are angular, the leaves narrow and fleshy, and the scape bore three flowers which in outline suggest *Masdevallia Chimæra*, being an inch across the broadest part and six inches in length. The broad dorsal sepal is colored yellow and purple and is tipped with a plume-like appendage; the petals are fringed and of the same color; the sepals are long and tail-like, purple, with a few yellow markings, and the small lip is crimson. It will be seen that the general characters of the flowers are those of *C. Collettianum*, but they are larger and different in color. Nothing is known of this plant except that it was imported by Mr. O'Brien from some part of southern India.

SOBRALIA LINDENI.—A plant of this distinct new species was shown in flower this week by Mr. Lucas, of Horsham, and was awarded a certificate. It has shorter stems than

Sobralia macrantha, and large flowers with the sepals and petals white, faintly tinged with rose, and the lip colored rich crimson-purple in front, paler toward the margin and streaked with chocolate-brown in the throat, the folded portion of the lip being white. Monsieur Linden claims for it the first position among garden Sobralias, and states that with him flowers were developed which measured ten inches in diameter and that the segments were snow-white. No doubt, the flowers will vary in shade in this as in other Sobralias, but, judged by the plant flowered by Mr. Lucas, it is a truly beautiful Orchid. It is most like *S. Ruckeri* in botanical characters. Imported plants of it were sold at auction for the first time in London by L'Horticulture Internationale in 1893.

CATTLEYA LABIATA, var. *COOKSONÆ*.—We are likely to soon have as many named varieties of the autumn-flowering *Cattleya*, distinguished from all others of the group by the term *Vera*, as we have of *Odontoglossum crispum*. This new one, which was awarded a first-class certificate on Tuesday last, has large well-formed flowers with pure white sepals and petals, a long lip, the tubular portion of which is white, the throat purple and yellow, and the front lobe brilliant purple, with a white crisped margin. Three other varieties of *Cattleya labiata* received awards of merit at the same time.

CATTLEYA MANTINI is a new hybrid between *C. Dowiana* and *C. Bowringiana*, which has been raised by Messrs. J. Veitch & Sons, and which obtained an award of merit last Tuesday. In general characters the flowers of the hybrid closely resemble *C. Bowringiana*, the only trace of the other parent being in the shortness of the tube and broad front lobe of the lip and in its colors, which are purple, with lines and veins of yellow and crimson.

ARISTOLOCHIA CLYPEATA.—Plants of this handsome tropical climber are now flowering at Kew for the first time. It is a native of Colombia (New Grenada), whence it was first introduced in 1868 by Monsieur Linden through the collector Wallis, but it does not appear to have become established in gardens then. Messrs. Sander & Co. have again introduced it, and until it flowered it was supposed to be *Aristolochia gigantea*, to which it bears a close resemblance. The Kew plants have corky stems and pale green, thin, cordate leaves three to six inches long, or a little larger than those of *A. elegans*. The flowers are borne on short racemes, which spring from the woody part of the stem; each flower is in form like *A. elegans*, but thicker in substance and about three times as large, the color being a rich velvety brown, with closely reticulating lines of pale yellow; above the ringed entrance to the tube there is a large blotch of blue purple which suggests the "eye" of a peacock's feather. The flowers have not a disagreeable odor. A figure of the plant will shortly be published in *The Botanical Magazine*.

BAUHINIA GALPINI.—This plant is now flowering for the first time at Kew. It was introduced from the Transvaal in 1891 by Mr. E. E. Galpin, who sent specimens of it to the Kew Herbarium, from which a description was made by Mr. N. E. Brown and published in *The Gardeners' Chronicle* for that year. At the same time Mr. Galpin sent seeds and recommended the plant as a handsome shrub likely to find favor with gardeners. At Kew it has grown into a somewhat branched shrub six feet high, the branches nearly horizontal, the leaves light green, bilobed, two inches broad, deciduous if properly treated. The flowers are produced in short racemes near the top of the small branches, and they are campanulate in form, with five equal petals, colored bright crimson, in appearance suggesting the flowers of a common Nasturtium. The Kew plant is grown in a dry sunny house along with Agaves, etc. I should say this plant would be a success in the southern states.

GYNERIUM JUBATUM.—This is a beautiful Pampas Grass from the mountains of Ecuador, which was introduced into cultivation about twenty years ago, but, owing to its not being sufficiently hardy to grow out-of-doors in Eng-

land, except in such places as Cornwall, it has not found much favor. In Mr. Gumbleton's garden at Cork, however, it is perfectly happy in the open air, although his largest specimens were killed by twenty-nine degrees frost experienced last year. He calls it the most beautiful of all the *Gyneriums* known to him, and certainly the inflorescence he has lately sent to Kew proves it to be exceedingly ornamental, in plume at any rate. The feathery portion of the plume is thirty inches long, and the branches, which are

HYPERICUM MOSERIANUM TRICOLOR.—This is said to be a branch sport from *Hypericum Moserianum*, but it has none of the characters of that hybrid, and if its origin is as stated, it is a case of reversion to one of the parents, namely, *H. patulum*, plus a very pleasing variegation. The habit of the plant is like that of *H. patulum*, but more horizontal; the leaves are smaller, narrower and somewhat variable in form, the largest being an inch long and half an inch wide; they are colored pale green, cream-yellow and cerise.



Fig. 62.—*Fothergilla Gardenii*.—See page 446.

1. A flowering branch, natural size. 2. A flower, enlarged. 3. A stamen, enlarged. 4. Vertical section of an ovary, enlarged. 5. Cross-section of an ovary, enlarged. 6. A fruiting branch, natural size. 7. A fruit with the valves laid open, enlarged. 8. A seed, enlarged. 9. Vertical section of a seed, enlarged. 10. An embryo, much magnified.

from twelve to eighteen inches long, are equally distributed all around the axis, so that the plume when held erect is very graceful and regular. The flowers (spikelets) are very silky and gray, with a tinge of purple. The plumes are apparently as lasting as those of the common Pampas Grass, *G. argenteum*. Mr. Gumbleton says the plant is a surface rooter.

Messrs. Sander have a large stock of this plant, and I learn from them that it is quite hardy, and that when at its best in autumn it is quite as effective as Mrs. Pollock Geranium. The plant is easily propagated, and it appears to be permanently variegated. Messrs. Sander advise that the young plants should be grown on in a cold frame for a year and then planted out in a sunny position in June. The flowers

of this variety are only about one-quarter of the size of those of *H. Moserianum*, which has proved a tremendous success in beds at Kew this year.

LESPEDEZA SIEBOLDII.—This is one of the handsomest of the shrubby Leguminosæ, which flower late in the autumn. It is grown in large beds in an exposed place on a lawn at Kew, where its elegant pendent branches form a Bamboo-like mass twelve feet through and four feet high, which is attractive before the flowers come in the latter part of September, when the branches are heavily laden with red-purple flowers. The shoots are annual, or at any rate they are killed down to the ground by frost, but the stools survive and in spring new shoots are pushed up in abundance. It is a native of China and Japan and has been in cultivation here many years, but it is not generally known in gardens.

NEW CHRYSANTHEMUMS.—A dozen new sorts of Chrysanthemums were certificated by the National Chrysanthemum Society and the Royal Horticultural Society. There is every promise of an exceptionally good display of these plants in England this year, the peculiar character of the season having been favorable to them. I am informed, too, that the number of new seedlings that are being tested by English growers this year is far in excess of anything ever done before. Those certificated were: Boule d'Or, large incurved, amber yellow, the inside of the florets chestnut red; Lady Esther Smith, large Japanese, with long, broad pure white florets; Lady Randolph, large Japanese, somewhat globular, the florets purplish amaranth; Lago Maggiore, large Japanese, with long, broad reflexed golden-yellow florets; Madame A. de Lacivivier, Japanese incurved, crimson, with yellow reverse; Madame M. Massé, Japanese, early, rosy mauve, golden centre; Monsieur C. Molin, large Japanese, with broad yellow florets tinged with carmine; Phœbus, yellow Japanese; President Armand, Japanese incurved, chestnut, with yellow reverse; Pride of Madford, large Japanese, purple, paler reverse; T. B. Haywood, large Japanese, white, of good substance (of Australian origin); Yellow Gem, a Pompon variety, with yellow fimbriated florets.

W. Watson.

London.

New or Little-known Plants.

Fothergilla Gardeni.

THE flora of the southern Appalachian Mountains is distinguished by a number of monotypic shrubs which are generally exceedingly rare and of local distribution; among them is *Fothergilla*, a member of the Witch Hazel family, distinguished by its short terminal, ament-like, pedunculate clusters of flowers, which are sessile and apetalous, and open in early spring from the axils of scale-like, tomentose, deciduous bracts. The calyx is campanulate, adnate below to the ovary and repandly five to seven dentate; on its margin are inserted in a single series about twenty-five long, straight, clavate white filaments bearing small yellow anthers, and rather longer than the two, or rarely three, slender spreading styles. The fruit is a two-lobed, two-valved, hoary tomentose, two-seeded capsule resembling that of the Witch Hazel in size and shape, and, like that of the Witch Hazel, ejecting the seeds violently on opening.

Fothergilla Gardeni (see illustration on page 445 of this issue), the only species, is a shrub of compact habit, from three to five feet tall, with numerous stout stems, large ovate pointed, light red, pubescent buds, and alternate, obovate, petiolate, deciduous leaves, rounded or acute and coarsely serrate at the apex, about three inches long, two or three inches broad, thick and firm, dark dull green on the upper surface, and pale and glaucous on the lower surface, which is more or less pubescent, especially along the midribs and numerous conspicuous primary veins. In early spring, before the appearance of the leaves, the flowers open on the ends of all the branches, covering the plant with brush-like masses of the long white stamens, which

are the only showy parts of the flower, and make it at this time a most conspicuous and beautiful object.

Fothergilla Gardeni grows naturally on the borders of swamps and streams on the Carolina coast and in the foot-hill region of the southern Alleghanies. Nowhere common, it has been collected in recent years near Wilmington and at Salem, North Carolina, at Caesar's Head, in the Blue Ridge, South Carolina; and by Dr. Mohr in the valley of the Tennessee River near Florence, Alabama; near Cullmann, Alabama, and at Prattville, Autauga County, Alabama.

Fothergilla Gardeni was introduced into English gardens one hundred and thirty years ago, and, judging by the number of figures that were published of it in Europe toward the end of the last and at the beginning of the present century, it must at that time have been a well-known and favorite inhabitant of gardens from which it has now almost entirely disappeared, in spite of the fact that few shrubs present a more curious and beautiful effect than *Fothergilla* when it is covered with flowers. Its habit is excellent, too, and its foliage is abundant and rich in color.

In the Arnold Arboretum *Fothergilla* is perfectly hardy, and flowers profusely every year, although it has not ripened its fruit. The flowering branch in our illustration is from a plant that has been growing for many years in the Arboretum. The fruiting branch is from the nursery of Mr. Thomas Meehan, of Germantown, Philadelphia, where *Fothergilla* ripens its seeds during the month of July.

C. S. S.

Plant Notes.

LIQUIDAMBAR STYRACIFLUA.—The American Liquidamber, or Sweet Gum, is one of the best of our large native trees for ornamental planting, and yet, although Downing commended it fifty years ago as one of the most beautiful of trees at every stage of its growth and during every season of the year, comparatively few of these trees, even now, are planted, and to far the greatest number of those who plant trees it is absolutely unknown. In the course of his enthusiastic description of the Sweet Gum, Downing says: "During the summer months it preserves unsoiled that dark glossy freshness which is so delightful to the eye, while the singularly regular palmate form of the leaves readily distinguishes it from the common trees of a plantation. But in autumn it assumes its gayest livery and is decked in colors almost too bright and vivid for foliage, and forms one of the most brilliant objects in American scenery at that period of the year. The prevailing tint of the foliage is then a deep purplish red, unlike any symptom of decay, and this is sometimes varied by a shade deeper or lighter, while occasionally an orange tint is assumed. When planted in the neighborhood of our fine Maples, Ashes and other trees remarkable for their autumnal coloring, the effect in a warm dry autumn is almost magical." He adds elsewhere that the tree, from the character of its outline, which is not specially picturesque, unites and harmonizes with nearly all other trees to make a good composition. In its general form it resembles somewhat a slender Sugar Maple, although its leaves are much more glossy than those of any Maple. Its somewhat narrow and pyramidal shape and its adaptedness to various soils and rapidity of growth make it useful for street-planting. The branches are rather short in proportion to the height of the tree, so that when it is young the head is rather sharply pyramidal. The broad star-shaped leaves, three or four inches across, are pleasantly fragrant when bruised, and the leafless branches are interesting in winter on account of the broad corky wings. It attains its greatest size in the Mississippi basin, where it is sometimes a hundred and fifty feet high, but it becomes a large tree in this latitude. It ranges naturally from Connecticut to Guatemala, but is somewhat tender on the New England coast. Besides the Sweet Gum and Liquidamber, the tree is known in different parts of the country as the Bilsted, the Red Gum

and the Star-leaved Gum. There are, at least, two other species of Liquidambar besides the American tree; one of these in Asia Minor, *L. orientalis*, furnishes the liquid storax of commerce; another one, *L. Formosana*, in southern and eastern China, and the island of Formosa, is the tree whose wood is largely used in making the chests in which tea is exported.

ACER CISSIFOLIUM.—The autumn foliage of this Japanese Negundo is hardly excelled in beauty by that of any other exotic tree. The leaves at the ends of the branches turn first to a bright scarlet while the others are orange-yellow, and the contrast makes an effect which is interesting, and almost unique. The tree is perfectly hardy; it grows compactly into a round-headed form, with clean slender leaves of a light pleasing color, and since the young shoots continue to grow long after most trees have finished their growth for the year, the delicate color of the foliage at the extremity of the branches gives it a fresh and distinct appearance at midsummer. It grows rapidly, too, and does not seem to have the constitutional weakness from which many of the Japanese Maples suffer here, so that it is altogether one of the most satisfactory of the Japanese trees which have been tried in our climate. It ought to be more common, for it has been fruiting in this country for many years, and it can be used to advantage wherever comparatively small trees are desirable. Its rather formal habit commends it especially as a single specimen on a small lawn.

CERATOSTIGMA PLUMBAGINOIDES (*PLUMBAGO LARPENTÆ*).—Covering the ground like an intensely blue carpet, this fine Chinese Leadwort is a beautiful object during the late autumn months. In habit it is almost creeping, but bushy and leafy, growing to a height of six or eight inches, and producing in dense terminal heads flowers of as deep a blue as can be found anywhere in the vegetable kingdom. The leaves are obovate, tapering to the base, sessile, with a hairy edge, and at this season they turn to bright crimson and orange. The plant is very floriferous and an admirable one for dry and sunny positions in rockeries and borders, and, although it starts late, it is useful for covering dry banks in places where grass will not thrive. It is easily propagated by seeds sown in a frame early in spring, or by means of division or layering of the half-woody branches, which, if covered with soil, root near the base.

Cultural Department.

Cattleya labiata.

VERY few Orchids in cultivation have come so near fulfilling all the claims made for them by introducers as this one, the type plant on which the genus was founded by Lindley soon after its first introduction in 1818. Its subsequent history, too, has added much to the interest it originally excited. Its total disappearance from the original districts from which it was introduced, the casual arrival of a few plants at various times from obscure sources, the futile efforts so long made to reintroduce it, and lastly its reappearance under the name of *Cattleya Warocqueana* from a province nearly five hundred miles distant from Rio, where it was first seen, all seem more like products of imagination than like reality. The supply of plants seems almost inexhaustible, judging from the number that have already found their way into cultivation from Pernambuco during the last four or five years. The benefits to horticulture are scarcely to be calculated, as this Cattleya flowers at a time when so few other plants are in bloom. The Orchid-houses now are transformed into a mass of gorgeous coloring that is not excelled by the display in early spring, when the other forms of *C. labiata* are at their best.

To the cultivator, perhaps, the most pleasing fact connected with this Cattleya is the ease with which it can be grown. Many other Cattleyas are of easy culture, but the best cultural skill has failed to keep them in collections for an extended period. *C. labiata* seems to furnish an exception to this rule. At the time of its reintroduction there were plants in gardens that had been cultivated for twenty-five years, according to the record, and possibly some of the first plants introduced are still living. They had no storehouse in the way of back bulbs

made in their native country to draw upon for their supply of vigor, but were growing and flowering freely under the system of treatment that is now adopted by the best growers. We have thus the assurance that *C. labiata* is not only a free grower, but has the crowning merit of longevity. It may now be bought as cheaply as any other Cattleya, while five years ago it was worth its weight in gold and the supply was meagre. It was formerly used to a necessarily limited extent for hybridizing purposes, but wherever it was so used its influence was potent for good. Some of the best crosses ever made have this plant for one of the parents. All who wish can now have a plentiful supply and make a free use of it, and the result will surely be for the common good.

We now have more of these Cattleyas than of any other sort. Their journey from their native place was a severe ordeal, since they traveled from Brazil to London, and thence to New York to the salesrooms. Many looked almost hopeless, but heat and a genial moisture works wonders under our clear skies, and pieces, with not more than two bulbs when they came, are now flowering, in many cases giving four flowers from the one bulb. Established plants frequently produce five flowers on one stem, and I have seen, in one instance, six flowers on the stem, all of good size and high color.

There is as much variation among plants of this variety as among any other, in that no two are alike, and each flower has its distinctive characters. As yet there is a very small percentage of white forms, and they are evidently not so numerous as we were led at first to believe they would be. Neither is there such radical variation as among plants of *Cattleya Trianæ* and other kinds, but there is a much smaller number of inferior varieties than in any other Cattleya, and I have yet to see one variety that has not some merit.

This Cattleya belongs to the section that flowers directly on the completion of the current year's growth. There is no apparent rest before flowering, and but a slight cessation after, for we find that the most active rooting season is just after the strain of flowering. The plants at once recuperate themselves, so it would be folly to dry them at the roots at this time. In newly established pieces there is always a tendency to make a growth out of season. We have many now that are doing so, but after a year or two this tendency disappears, and they get into a regular habit and adapt themselves to our seasons, which are different from their own in Brazil. There no rain falls for six months, but the night dews must be heavy, or the plants would not be found there. The cultivation of this Cattleya is similar to that required by other members of the same group. After repeated trials we have given up using moss with the fern-root for potting material. There is no advantage from its use, and it too often brings in snails and slugs. It causes the other portion of the compost to sour and hastens its decay, and finally causes the decay of the roots of the plant. If good fibrous *Osmunda*-roots are used as soon as possible after they are gathered, this potting material should keep in sound condition four or five years. The roots will remain healthy if perforated pots or pans are used. We have given up the use of baskets for Cattleyas. In the first place they are costly if made of cedar-wood; and to take out a plant that is well and firmly fixed in a wooden basket causes so serious a check that it often takes a season or two for the plant to recover. Perforated pans can be easily obtained, and cost about as many cents as the plants are worth dollars. They are readily broken when it is necessary to give a plant a shift without any material damage to the roots if the plant is well watered a day or two before. If shifted at the proper time, when root-action is commencing, there will be no shrinkage of the bulbs whatever. For the small-growing Cattleyas and *Lælias*, such as *C. Walkeriana*, *L. præstans* and *L. Dayana*, we take a square block of fern-root as it is sown off and peg the small pieces on, suspending this in the usual way. It is amazing how they thrive. *C. Walkeriana* has made bulbs that far exceed in size any made in its native country, and is now showing flower freely. To the close observer there is much to be learned in matters of detail; while these are often small in themselves, they go to make up the difference between failure and success. There is an all-absorbing interest in the purchase of dried-up pieces as they come from their native woods and in watching them expand as heat and moisture are supplied. But the greatest interest is at flowering time, when the buds are eagerly watched as they develop. They are oftentimes white until after the first day of opening, when the tinge of pink is almost sure to appear, for true white ones are very rare. Some of these rare white flowers are described as being so beautiful that the possibility of securing flowers of this color is all the more fascinating.

E. O. Orpet.

South Lancaster, Mass.

The Germination of Nuts.

IT is a very common notion in the north that nuts—butter-nuts, for instance—will not grow until they are frozen, and that this freezing is necessary to open their shells. A moment's thought ought to recall the fact that many of the hardest-shelled nuts are native to regions where freezing is unknown. As for our northern nuts, they drop with or before the foliage of the trees which bear them; and in the still air of the forest or grove the snow lies level, while the dead leaves, with the snow, constitute, even here in northern Vermont and adjoining Canada, one of the most perfectly frost-proof coverings, habitually made use of in our gardens to protect our half-hardy and tender plants in winter.

Some—indeed, I think many, if not all our northern nuts—retain their vitality, under favorable conditions, for many years. Having last spring a call for a lot of young Butternut-trees, I planted a considerable quantity of nuts which had been kept in a shed-loft for four or five years. Every nut vegetated, and they have all made a growth of from ten to twelve inches during the season. These nuts have unquestionably been subjected to a temperature far below zero every winter since they were gathered, but none of their shells were cracked or loosened. I do not think their vitality would have been preserved had this occurred.

So far as my observation and experience have yet extended, in reference to the vitality of nuts (and these cover a considerable extent of territory—from Canada to Tennessee), they rarely vegetate extensively near the trees from which they fall. Perhaps this is chiefly due to the activity of boys and squirrels in harvesting the crop. Where the trees stand closely there may also be a lack of sun-force to start germination. If it were not for its rough strong shell the butternut would have a very extensive sale, for in quality it is decidedly superior to the so-called English walnut, and it will endure a much colder climate.

Newport, Vt.

T. H. Hoskins.

Trenching in Vegetable Garden.

INDEPENDENTLY of manures garden soils may be improved in many ways, and at no season of the year can these improvements be better carried out in this section than the last part of October and first half of November. The principal plan for making soils better is to pulverize them deeply by digging and trenching. This makes finer particles and a greater surface for the rootlets of plants to feed upon; it enables them more easily to penetrate in every direction in search of food and promotes a free circulation of air and water. There are few gardens which would not be vastly benefited by such trenching, and especially is this true of gardens which have been under cultivation for thirty or forty years, or even more. In Great Britain, where many gardens have been cultivated a century, and others much longer, it would not be possible to secure the best crops by merely gorging the land with manure year after year. I have in mind a vegetable garden in England which has been constantly cropped for over two hundred years, and still produces vegetables of the very highest quality.

Digging and trenching render the humidity of the soil more uniform, so that the plant-food which is held in solution by water is made available for all the roots. Fertilizers are useless unless they are dissolved, and thus prepared to be taken up into the circulation of the plant. During the spring and early summer months soils need to be warm to stimulate root-action and to help the decomposition of manures, and deep digging and opening helps in this way.

In trenching, care must be taken to regulate the work according to the depth of soil. If trenched too deep the best soil is buried under the crude infertile subsoil, in which vegetation will not flourish. We endeavor to trench a portion of our vegetable garden each fall, and usually go three spits deep, this being as deep as the roots of most of the plants penetrate, but for Parsnips and other root crops it is best to go deeper if the quality of soil will permit. In some soils there is less necessity for trenching than in others, but where the ground has been in constant cultivation for half a century, as in our case, such an operation cannot be dispensed with if crops of high quality are desired.

When trenching, a good dressing of well-rotted manure should be worked in if the ground is of a heavy clayey consistency, as much of ours is. Sharp sand, wood-ashes, lime, lime rubbish or broken shells all help to break its tenacity and make it work more pleasantly. Light, sandy and gravelly soils are naturally warmer than stiff and heavy soils, and while they do not produce as fine a quality of crops, they are useful for

early crops, which mature more quickly than on heavier land. These light soils are not readily benefited by manures, as the finer particles are washed away by the rains; they are improved by the addition of strong loam, which should be applied in sufficient quantity to form a compost which will retain moisture enough for garden crops.

Generally speaking, a moderately tenacious soil is the best and most productive, but as earlier crops can be had from a lighter kind it is advantageous to have both in a garden. Where the ground is very stiff and clayey, if it can be thrown up rough cast before winter, the frost will help to pulverize it and make it work better another season.

Taunton, Mass.

W. N. Craig.

Correspondence.

Frosts and Fruits.

To the Editor of GARDEN AND FOREST:

Sir,—It is very common to err in estimating the damage done to a fruit crop by late frosts in the spring. The present year affords a remarkable illustration of this fact. The reports gathered from various points in New York, Pennsylvania, Ohio, West Virginia and Maryland immediately after the severe frosts of the second week of May, indicated a very general destruction of all the large and small fruits, and every kind of fruit which I carefully examined in the western part of Pennsylvania was actually blackened—apples and pears being then as large as peas. In fact, the cold was so severe and the time of it so unfortunate that even the new growth of three or four inches on the Oaks was entirely blackened in certain places. Gardeners generally had their Tomato plants set out, and their early Beans had vegetated; these were totally destroyed, and in the rush for more seeds the local stores were exhausted of their supply. All this made it natural to prophesy that fruit and certain vegetables would be scarce and high-priced.

Now, having lived through the season, we can look backward and observe that this has been a year of plenty. There seems to be no county or state where apples are grown that reports a want of this staple fruit, and the prevailing wholesale price for the best winter apples is no higher than it was during the harvest of the great crop of 1893. In this valley, among the mountains of central Pennsylvania, orchards on neighboring farms were very differently affected by the frosts—in one case resulting in an entire failure of fruit; in the other, a very large crop of fine fruit. This singling out of certain orchards seems to have been without apparent reason. Orchards extending up the mountain sides yielded full crops on the trees of the upper portions and generally failed below. The College Apple orchard of five hundred trees was in full bearing, and being an experimental orchard it contains about seventy-five varieties of apples. No variety seemed to be severely tried by the frosts, but all matured as full a crop as they are accustomed to do. Grapes were also very irregularly affected by these frosts of May, but, in general, more severely than the large fruits. In small vineyards, where the damage was least, some varieties exhibited greater resistance than others. Concord, Delaware and Worden proved the hardiest.

Pennsylvania Experiment Station.

George C. Butz.

Doubling of Flowers.

To the Editor of GARDEN AND FOREST:

Sir,—I venture to offer the following note in view of some allusions to the manner in which flowers become double. The phenomena known as doubling, a frequent occurrence in the garden or greenhouse, is generally a transformation of the stamens to petals or sepals or a replacement of the stamens by the latter organs. The sexual reproductive system in plants is a modification of the vegetative system, and gradual transitions exist between the sepals and the pistil, as is plainly seen in the flower of a Water-lily. It is also seen in the Canna, the showy portion of which is composed of transformed stamens, which in many cases still persist to the petal-like organs. It should be remembered also that in the evolution of the reproductive system the pistil has been more widely modified from the original leaf-form than other organs, the stamens less, the petals still less, and the sepals and bracts comparatively little. It is important also to note that a closer morphological relation exists between the leaves and the perianth, and between the leaves and stamens, than between the stamens and pistils. It is not difficult, therefore, to see, because of the close interrelationship of the vegetative and reproductive organs, that if the one is highly forced and made variable, the other must necessarily be affected.

The tendency to doubling, according to Lindley and other horticulturists, is in proportion to the number of stamens and pistils in the flower, and the conditions which bring on doubling are rapid forcing and high cultivation or fertilization. In other words, whenever, from any cause, an excessive development of the vegetative system results, then doubling is likely to occur. A plethoric condition of the plant induces it, and a gardener recently told me he believed any flower could be made to double under continued high cultivation.

Another set of facts indicates that doubling is produced by overnutrition. Plants that produce double flowers in rich soil often produce single ones when changed to poor soil, and, furthermore, toward the end of the season, when the vigor of the plant is waning, double Carnations, Roses, Poppies and other flowers often become single.

We can now see why rapid forcing and high cultivation tend to produce double flowers. The plant in that condition is directing its energies toward an increase of its vegetative system, and its vegetative activity is so powerful that it extends to the reproductive system, and the essential organs of reproduction are replaced by sepals or petals, which are more closely allied to the vegetative organs. The stamens are more often affected because, as has been pointed out, they have a closer morphological relation to the vegetative organs than have the pistils. When this vegetative exuberance is carried a step further the pistil may be replaced by petals.

Cornell University.

G. Harold Powell.

Exhibitions.

Forestry at Atlanta.

ALTHOUGH not so large as that made two years ago at Chicago, the forestry exhibit at Atlanta is certainly the most instructive and, from an educational point of view, the most valuable that has yet appeared at any of the great exhibitions held in this country. It has been arranged under the general direction of Mr. B. E. Farnow, Chief of the Division of Forestry of the Department of Agriculture, who made the scheme of the exhibit and prepared the plans for the attractive rustic buildings in which he has installed it. The group arranged by the Division of Forestry is the most interesting and valuable feature of the exhibit. More than two hundred and eighty species of the southern trees are here represented by dried branches, showing flowers, foliage and fruit, and by specimens of wood and bark. These specimens are accompanied by maps of North America showing the distribution of the species. The distribution of the twenty chief timber trees of the south is shown on much larger maps, accompanied by sections of the trunks of full-grown trees, pieces of the wood polished and unpolished, the whole being surrounded by large frames made from the bark of the species. The methods and results of the timber tests now carried on by the Department are shown by pieces of the wood used to determine their strength and resistance to pressure in various directions, as well as by the testing machine itself. Three maps in high relief show an imaginary southern farm ruined by erosion following excessive deforestation, and the same farm improved by partial and by sufficient forestation with its increased fertility. These models, which are well considered and effectually carried out, make one of the most instructive features in the whole exhibit, and several rural economists who have seen them declare that they should be reproduced and a copy deposited as an object-lesson in some accessible place in every county town throughout the south.

For the exhibit made by the Department of Agriculture the jury has recommended a gold medal, the highest award at their disposal; and to Mr. B. E. Farnow, "for his conspicuous skill and devotion in preparing and installing the exhibit," a special individual diploma, similar diplomas being recommended for his assistants, Mr. George B. Sudworth, of Washington, and Dr. Charles Mohr, of Mobile.

Mr. J. G. Schuler, who is a German turpentine manufacturer, of Edgewood, Louisiana, exhibits his new process for obtaining turpentine from Pine-trees. A modification of the French method, it has the advantage of reducing considerably the danger which "boxed" trees are subjected to by fire, while the quality of the product is improved and the individual tree is less injured than it is by the method now generally adopted in the United States. The jury recommended a silver medal to Mr. Schuler for his invention, which either in its present form or with some further modifications seems destined to add millions of dollars to the productive value of the Pine forests of the southern states.

An admirable collection of planks of selected timber-trees of

North Carolina, accompanied by photographs, is exhibited by the Geological Survey of North Carolina, which receives a silver medal for its exhibit.

The timber of one hundred and fifty indigenous trees of Georgia, each log being accompanied by a map showing the distribution of the species in the state, is exhibited by the Geological Survey of Georgia. This collection, which is the fullest of its kind here, receives a silver medal, while a special individual diploma is given to Mr. John K. Small, of Columbia College, "for the intelligence, zeal and industry which he has displayed in collecting it" during the few months allowed him for the purpose.

One of the most instructive exhibits here is that of the Mobile & Ohio Railroad, consisting of a collection of planks and trunk sections of twenty-six of the most important trees of southern Alabama and Mississippi, together with six original maps, prepared by Dr. Charles Mohr, of Mobile. These show the distribution of the principal timber-trees of Alabama, the chief centres of lumber manufacture in that state, and the statistics of the yield of forest products on the line of this railroad. These maps are the most important original cartographic work in the whole Forestry Exhibit, and Dr. Mohr is especially commended for them by his associates on the jury.

The method of producing naval stores, with the tools used in the process, a model of a turpentine-still and samples of naval stores of all kinds are exhibited in a most instructive manner by the Savannah Board of Trade, although, unfortunately, this exhibit is not in the Forestry Building, and may, therefore, be overlooked by special students of the subject, who would hardly expect to find it in a gallery of one of the other buildings.

Several individual exhibits are instructive, especially that of H. W. Russell, of Huntsville, and Von Beren & Company, of Evansville, Indiana, who show logs and billets of hickory and the application of this wood in the manufacture of tool handles and wagon and wheel stock; that of the Western Carolina Lumber Company, of Asheville, North Carolina, who show lumber of Liriodendron and its application to the interior finish of houses; the Hilton & Dodge Lumber Company, of Simonsville, Georgia, who exhibit the wood of Taxodium and its application in the arts; the Missouri Lumber Company, of Granden, Missouri, who show beautiful specimens of the Short-leaved Pine (*Pinus echinata*), in various stages of manufacture and its application in the arts; the Nininger-Gregg Company, of Curly, Alabama, who show logs of Red Cedar (*Juniperus Virginiana*), and its application in the manufacture of wooden-ware; the Atlanta Lumber Company, of Atlanta, Georgia, who show the Long-leaved Pine in its various stages of manufacture and its application in the arts and in construction.

The beauty of the building is heightened by photographic transparencies of important timber-trees placed in the windows, and exhibited by the Caldwell Lumber Company, of Lenoir, North Carolina.

It is, of course, impossible to mention in an article of this character all the exhibits, but enough, perhaps, has been said to show that forestry, in its educational aspects, has never been shown so well before in this country. In closing its report to the Commission of Awards, the special Jury in Class A (Forestry) takes occasion to say:

"Maps and statistics, forming parts of exhibits submitted to the Jury in Forestry, furnish independent evidence of the exceptionally rapid and improvident destruction of the magnificent deciduous and coniferous forests of the south. To this evidence, substantiated as it is by the personal knowledge of the Jury, we desire to call special attention, as well as to the remedy for the condition it discloses. An analogous condition in nearly all other parts of the country is within the experience of the members of this Jury, which has extended to an examination of the forests of every state and territory in the Union. In view of the serious and peculiar dangers which, in our judgment, threaten agriculture and commerce from the destruction of forests throughout the country, and the immediate need for the application of the remedies, we are impelled to lay the following brief statement of the latter before you.

"A fundamental cure for these evils lies in a general knowledge of the nature of forestry, and a recognition by the people of the fact that it offers a practical, efficient and available means, in the United States, of harvesting a forest crop without injury to the forest. But the formation of public opinion is necessarily slow, and in this instance action is required at once. The first step, therefore, should consist of legislation to favor the protection of forests throughout the United States, and more especially for the permanent preservation and protection of forest lands about the headwaters of streams, much

of which in the western mountain ranges still remains, and should forever continue, in the possession of the Government."

The report is signed by Charles S. Sargent, Chairman; Charles Mohr, William M. Canby, Henry Trimble, John Berkinbine and Gifford Pinchot, Secretary.

Notes.

Miss Frances Prince, 17 Jay street, Boston, resumed her classes in Botany on the first of November. The Winter Aspect of Trees, the Ferns of New England, the Evolution of Plant Life, Weeds and Wayside Plants are four subjects upon which ten or more lessons will be given.

One of our common Asters is *A. undulatus*, and it usually grows on dry, hungry land, but when it is planted in rich, deep soil it will reach a height of four feet, spreading into a fine bushy shape, and at this late season it still bears abundantly its medium-sized heads with light blue rays and continues to make a show when most other flowers are gone.

The first shipments of the new crop of almonds reached this city from California about two weeks ago. About fifty car-loads is the estimated crop of these nuts for the entire state this year, and, of course, only a portion of this amount will come to this market. New-crop English walnuts are also here from the same state, and specially thin-shelled ones, known as Paper-shell walnuts, are said to be superior to the French Grenoble walnuts. The new Italian and French walnuts have also reached us, with new Tarragona and Ivica almonds from Spain, Princess Paper-shell from France, and shelled Jordan almonds from Spain.

In connection with a lecture last week in Plainfield, New Jersey, on the geographical distribution of trees, by Mr. John Gifford, editor of *The Forester*, there was an interesting exhibition of some work by the pupils of the Dalziel Manual Training School. This was a collection of various ornamental articles, such as vases and the like, made from twenty different species of trees growing in the neighborhood of the school. Most of the articles were highly finished and polished, although on some of them the bark was allowed to remain on certain portions, and in every case the name of the tree which furnished the wood was written. The leaf, flower and fruit of the trees were also shown, effectively mounted.

We have taken occasion in former years to commend the intelligent zeal of the Linnaean Club, of Jamaica, Long Island, an organization whose activity is directed to many useful purposes besides the study of botany and other natural sciences. It is in effect a village improvement society, and not only encourages the cultivation of flowers, but the preservation of our native herbs, shrubs and trees. The fifth annual flower show of this club will be held in the Town Hall on the 7th and 8th of November, and, as usual, premiums are offered for herbariums of native plants, for properly named dried grasses and seed-vessels suitable for winter bouquets and the like. Last year the exhibits in these classes by the pupils of the public schools were of unusual interest, some of the best having been made by children under twelve years of age.

The best vegetable-stands in the large markets are, perhaps, even more showy now than in midsummer. All the summer vegetables are still seen, for the last sugar corn and tomatoes may yet be had, with new Brussels sprouts, leeks, salsify, celeriac and kohlrabi, and new peas, beans, okra and eggplants from southern gardens. Striking color-effects are produced by the creamy heads of cauliflower in their green foliage, dull red beets, clear yellow carrots, white parsnips, deep orange pumpkins and bright radishes, relieved by the many shades of their fresh stems or leaves. Besides watercress, many green lettuces and the bronzy purple kale, there are now coming into market the new crop of dried thyme, sage and sweet marjoram, while the stalls, gayly festooned with strings of small red peppers, are aromatic with fresh mint, tarragon and other fragrant herbs.

Twenty new Chrysanthemums were inspected on Saturday in this city by an awarding committee of the New York Florists' Club representing the National Chrysanthemum Society. The plants certificated were the following: Mrs. Perrin, shown by E. G. Hill, of Richmond, Indiana; flower loosely incurved, deep rose-pink, silvery reverse, unsurpassed in color and first-rate in stem and foliage. Marion Cleveland, shown by T. H. Spaulding, Orange, New Jersey; flower incurved Japanese, large, lemon-yellow, shading to light canary, a new color in this class. Miss Agnes Louise Dalkson, shown

by M. Hansen, New Durham, New Jersey; flower loosely incurved Japanese, a sport from Ivory and identical in form and foliage, but of a clear pink color. Baltimore Belle, shown by John N. May, Summit, New Jersey; flower incurved Japanese, white, with a faint blush, an improvement on the Mrs. H. McK. Twomley. The other varieties were all good, and some of them quite distinct, like Mr. May's Infatuation, a half-tasseled cream-white flower; but they all failed to reach the highest standard in some requirement, or were not considered superior to varieties already in commerce.

Mr. T. V. Munson writes to the *Farm and Ranch* that in a large portion of eastern Texas, where there is considerable moisture, varieties and hybrids of *Vitis vinifera* have been rendered almost useless by the black rot, in spite of five applications of the Bordeaux mixture. Some native varieties, like Ives, Perkins and Norton, have borne good crops with no treatment. Champion, Moore's Early, Woodruff, Worden, Agawam, Concord, Goethe and many others were saved with two sprayings. Moore's Diamond, Brighton, Green Mountain, Niagara, Empire State and others yielded a fair crop when sprayed once just before flowering, again when the young grapes were the size of pigeon-shot, and a third time nine or ten days later. Mr. Munson says that in south-western France the grape crop has been nearly destroyed by the black rot this season, which was characterized by excessive rains during spring and summer. The disease was so virulent that spraying with the copper compounds did not seem to check it. It is the difficulty of overcoming the rot and mildew which prevents the successful cultivation of the *Vinifera* varieties in most parts of this country, although in the arid regions of western Texas they succeed quite well. The power of resistance which different varieties have to the black rot is certainly an important point to be considered by all who are planting vineyards.

The Norway Maple is an admirable street-tree in our eastern cities, and although it is sometimes disfigured in summer by thrips, especially farther inland, it appears to flourish as well near the sea as most of our own Maples. It also holds its leaves later than our native sorts, and, unlike many other European trees, it has the merit of coloring beautifully in the autumn. For some years we have observed in a neighboring city a row of these trees which are about thirty years old, in first-rate health, and just now they are making a striking display. On one of them nearly every leaf is colored throughout with the same tint, a light lemon-yellow, and when the sun shines through the foliage it is singularly beautiful. Next to it is a tree which shows hardly any yellow whatever, although on examination most of the leaves are seen to have a narrow strip of yellow along the prominent veins, the remainder being a light crimson. For three successive seasons, at least, these trees have each one shown this difference of color, a fact which goes to justify the belief that individual trees of different species have a constitutional tendency to turn to the same color every year. The foliage of other trees in the row is yellow and scarlet, with these colors distributed in various proportions, most of the leaves being yellow in the main, but with occasional blotches and splashes of crimson, margined with a zone of crimson.

During the past week 16,000 barrels and boxes of Jamaica oranges were sold here, and small lots of Havana oranges have already come to this port. Mexican oranges are now reaching Chicago and other western markets. It is said that boxes are being shipped to Mexico from Bangor, Maine, and the oranges are attractively packed in these in Florida style. The first of the new crop Sicily lemons reached here last Friday and will be sold at auction to-day (Wednesday). High grade Majori lemons are quoted at \$11.00 a box, wholesale, but lemons which command this price are scarce. A more general wholesale rate is \$5.00, ranging to \$3.00, and fruit of the latter grade is sold on the street-stands for one cent each. The quantity of Almeria grapes expected to reach this country this season is variously estimated at 90,000 to 150,000 barrels. Their keeping qualities are exceptionally poor. Prices at recent sales ranged from \$1.37½ to \$9.25 a barrel. Grapes comprised nearly all of the seventeen car-loads of California fruit sold here last week, Black Moroccos being in greatest quantity. Some belated peaches from the Hudson River district and Connecticut are still in market, but the demand is slight and prices correspondingly low. A few Delaware and Niagara grapes are still occasionally seen here among offerings of Concords. The stock of the latter will be exhausted before Thanksgiving. Catawbas are said to be of excellent quality this year with respect to color, texture and flavor.

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLE:—Coöperative Agriculture.....	451
Autumn Color in the Pines.....	<i>Mrs. Mary Treat.</i> 451
The New York Cut Flower Company.—I.....	<i>M. B. C.</i> 452
NEW OR LITTLE-KNOWN PLANTS:— <i>Berberis heteropoda</i> . (With figure.)	<i>C. S. S.</i> 454
FOREIGN CORRESPONDENCE:—London Letter.....	<i>W. Watson.</i> 454
PLANT NOTES.....	456
CULTURAL DEPARTMENT:—Fern Notes.....	<i>William Scott.</i> 456
Half-hardy Shrubs.....	<i>G. W. O.</i> 457
The Winter Cantaloupe.....	<i>Robert P. Harris.</i> 457
Aralia Veitchii	<i>G. W. O.</i> 457
Cucumis dipsaceus	<i>L. H. B.</i> 457
CORRESPONDENCE:—Keeping Grapes Fresh all Winter.....	<i>John Benson.</i> 458
Late-flowering Golden-rods.....	<i>C. L. Allen.</i> 458
EXHIBITIONS:—The Horticultural Show in Philadelphia.....	458
The Boston Chrysanthemum Show.....	459
NOTES.....	460
ILLUSTRATION:— <i>Berberis heteropoda</i> , Fig. 63.....	455

Coöperative Agriculture.

HOW to make agriculture a profitable industry is the problem which seems to be puzzling all the civilized world. It is admitted that sound technical training is an essential requirement in general agriculture as well as in any of its special fields, like truck-farming, fruit-growing or floriculture, but, even when the scientific knowledge and the practical skill have been assured, it is only by some form of combination that the highest success is gained. It was thirty years ago when Denmark began to offer her young farmers an opportunity for technical education, but it was coöperation which at last enabled her dairymen to compete successfully with those of Great Britain and other nations in their own homes. In this country, wherever some special branch of agriculture has become localized, and almost the entire population is engaged in one branch of the business, a certain kind of coöperation is easy. In a community devoted to the raising of fruit to be dried, as in Wayne County, New York, large evaporators are naturally constructed, in which the products of several farms can be cared for. The canning factories and the vinegar and pickling factories in certain sections where truck-farming prevails are other examples of this sort. This is coöoperative production.

Again, we have certain associations for coöperative purchasing, which resemble in a degree the agricultural syndicates in France, which unite to buy supplies at wholesale prices. The farmers in many of the towns in New Jersey have proved that by uniting to buy the ingredients of fertilizers at wholesale prices and mixing them at home they can not only purchase the raw material for crops much more cheaply, but they are sure of getting their phosphoric acid, their nitrogen and their potash in such a form as they want it and of guaranteed purity. In the same way feeding stuffs for farm animals are procured. In France the use of commercial fertilizers has increased threefold since these syndicates were founded, while the price of the material has been reduced in some cases as much as fifty per cent. The New Jersey Experiment Station is ready to give expert counsel to farmers about the fertilizing material they need, and the result is that cheaper and better fertilizers and more of them and a more intelligent

application of them all unite to bring an additional profit to the business.

Coöperation in marketing is another hopeful way of diminishing expenses. The truck-farmers of various portions of the south have learned to unite so that they can guarantee the transportation companies a car-load every day. The car is then side-tracked for the use of this community and they arrange to fill it so that their shipment may be made at car-load prices by fast freight instead of in small lots by express. In this way one of the heaviest items in the market expenses is reduced to a minimum. Another help in marketing is the union of the peach-growers, the berry-growers, or the poultry-raisers of any community into an organization which has a correspondent at the leading markets with whom they are in telegraphic communication, so that they are advised of the state of the trade in every place which it is possible to reach with the products of their farm. From the morning reports from all these points the local manager is able to inform individual growers how much fruit or how many spring chickens will be probably demanded in Philadelphia or Boston or Elmira, and the product is in this way intelligently distributed instead of being all forwarded blindly to one point, which may already be glutted. The fruit sales of California growers in this city is another development of this idea, and the New York Cut Flower Company, of which organization a partial account is to be found in the present number, attempts to save the percentages paid out to commission merchants, to escape the alleged abuses of the commission system and to bring the grower and consumer into more immediate contact.

The last number of the *Contemporary Review* contains an elaborate discussion of this question, from which it appears that these helpful organizations are much more numerous and more efficiently conducted in Europe than they are in this country. There are threshing syndicates in France and Germany, by which the grain is taken from the straw at a minimum cost, and a project is on foot for the purchasing of steam-plows and other machinery for breaking up the farms of an entire district so that even small cultivators can have the advantage, not only of steam-power, but of such implements as rollers and drills. Already in France there is much coöperation in irrigating lands, and even for such special work as the burning of smudges over a large area to protect vineyards from frost. One great advantage in coöperative selling is that the collection of any product at a given point insures a large, steady supply, and this attracts buyers and usually commands better prices. This is why the agricultural syndicates of Normandy get better prices for their horses and cattle and apples and cider than individual producers do, and why the associations of Switzerland have all their fruit sold in Berlin before it is gathered, and why the millions of eggs from the Danish societies find English buyers, and why special vegetables, which experience has proved to be abundant and well-grown in certain districts, have always a secure market in distant countries. In this country the same experience has been often repeated. In the extreme northern counties of New Jersey a few years ago there were scattered Peach orchards, and although the fruit was sent to market in good condition the sales were unsatisfactory, because nothing was known of the fruit except as it dribbled slowly into the market where it was at the mercy of chance buyers. Now, when the whole district is given over to Peach culture, buyers from half a dozen states are there before the crop is matured and make arrangements to take the entire product.

We have no space to enumerate the various ways in which these large partnerships are made to help in almost every department and process of agriculture, from the breeding of stock to the pickling of cabbages, but as an instance of the flexibility of these associations it may be said that some of them employ a common lawyer on a salary who gives gratuitous advice to members, and when he advises proceedings or a defense the association

undertakes to pay one-half, two-thirds or three-fourths of the cost, as the case may be. The most important and beneficent use to which this system has been put, as it is set forth in the article we have noticed, is the provision of a credit to the farmer which corresponds to the draft credit, without which no manufacturer or merchant could profitably carry on his business. The details of this scheme are too intricate to be described here, but it is asserted that this system helped the farmers in many parts of Germany over the effects of the disastrous drought of last year, and that the German dairies and wine cellars depend for their support on these credit banks, which demand little money at the outset but much security, and recover the debt rapidly and steadily out of the profits. As much as a hundred and fifty million dollars is said to be loaned out every year to German farmers by these banks, and a single coöperative bank at Augsburg lends out annually five million dollars. Under the system the money comes back with almost absolute safety, the losses on agricultural loans being incomparably smaller than those on other loans. One bank is mentioned in Silesia which in fifteen years lost only one hundred and fifty pounds out of more than six and a half millions of pounds loaned.

One great drawback to successful agriculture in America is the fact that so much of the money invested in it is fixed capital, representing land, buildings and the like, while the farmer has so little floating capital with which to take advantage of the market when he comes to buy fertilizers and seed and feed for stock and other raw material. Credit is not exactly capital, but if our agricultural communities were sufficiently stable to guarantee the success of some credit system like those now established in Europe it might be a boon to progressive farmers. There has been abundance of credit given in this country, as the cotton farmers of the south learned to their cost when they pledged their crops in advance as security for all they bought, but it was at ruinous rates, and it meant mortgage and bankruptcy. If under this European system a sound credit could be made to give farmers the advantages of cash prices which would much more than pay a low rate of interest, the aggregate gain in many branches of agriculture would be enormous.

Autumn Color in the Pines.

THE color in the Pines is unusually brilliant this autumn. Many of the White Oaks are carrying bright scarlet leaves, while the foliage of the Chestnut Oaks takes on more of a yellow tinge. Never have the various species of Black Oaks made a more characteristic display than at this time. The hues range from deep crimson to bright scarlet, while the leaves on some trees are still green, with here and there blotches of red, as if they had been spattered with blood. The section of Black Oaks is puzzling, so widely do the leaves vary, often on the same tree. On some branches the leaves are but slightly lobed, while those on other branches of the same tree are deeply and narrowly lobed. The White Oaks, too, have marked individuality. A large tree in my garden has certain branches to which all the leaves cling through the winter, and only loosen their hold in late spring, when the swelling buds push them off. The rest of the branches lose every leaf in autumn. They all turn to a uniform bright red—those that fall as well as those that remain.

The foliage on some of the Sweet Gum trees here is a rich dark purple, while on others near by shades of crimson and yellow prevail, and these trees take on the same colors each year. A Sweet Gum which turns to purple one autumn is always purple, while a tree once dressed in crimson and gold is always the same. But the Sour Gum, *Nyssa*, never shows such diversity of color, its leaves being uniformly a bright scarlet. The White Maples show the effect of the frost more than most trees. The leaves that were bright yellow a few days ago are now mostly brown and withered, while some of the Swamp Maples remain a

blaze of red. Many of the Sumachs still hold their scarlet leaves and fruit-clusters. The yellow of Hickories and Birches is uniform and constant among the varied tones of the Sassafras and Dogwoods, many of which are yellow here, although, as a rule, red is the prevailing color.

The shrubs, too, make brilliant masses of color, especially those in the Heath family. The Vacciniums are purple, crimson and scarlet; Andromedas gleam through various shades of red to a bronze-purple, while the varied shades of red in Leucothoë mingle with the yellow of Clethra and Azalea *viscosa*. The fruit of the Black Alder shines brightly red among its greenish-yellow leaves and contrasts well with the red-brown foliage of *Alnus serrulata* near by. Baccharis, with its plumy pappus, looks at a little distance like masses of white flowers, and mingling with the autumnal color is very ornamental, but the Wild Roses are a disappointment. The hips at this time of year are usually plump and bright red, but now they are blackened and look almost charred with the excessive heat and drought. The leaves of the tall Blackberry are red and purple, while those of the Sand Blackberry, *Rubus cunifolius*, are still green, and the running Swamp Blackberry, *R. hispida*, is always attractive with its rich shades of color, creeping among the Grasses and Sedges. Very handsome, too, are the Cranberries, trailing through the sphagnum with purple and green leaves and scarlet and crimson fruit. Ampelopsis and different species of Smilax are clambering everywhere, mantling dead trees and every other unsightly object with the splendor of the season, and all this wealth of color, mingled with the green of the Pines, Cedars, Hollies and Laurel, is beautiful beyond expression. And yet—ought I to confess it?—we are hardly satisfied with the display made on these low levels. If we could only see a forest sweeping triumphantly up a mountain slope, or a broad landscape billowed with wooded hills and deep valleys! Only in scenery of this kind is the pomp and magnificence of an American autumn fully unfolded.

Vineland, N.J.

Mary Treat.

The New York Cut Flower Company.—I.

AFTER entering the wide hall of the spacious building at 119 West Twenty-third Street, New York, the visitor is carried by the elevator to the second floor and ushered into the commodious rooms of the New York Cut Flower Company. The first glimpse of the main salesroom, even at a quiet hour of the day, suggests a large and multiflora business; in a busy time the visitor finds himself suddenly among the largest collection of cut flowers on this continent. A moment is needed to collect himself after the burst of color and gale of fragrance which greet him, and then he will see substantial broad white tables ranged along the sides of the room and set in parallel rows between them, with generous floor-spaces reserved for salesmen and buyers. Every day of the week this room presents an animated scene, for, even on Sunday, in the early morning, exceptionally energetic Christian buyers are on hand for the freshest and most fashionable flowers for decorating houses of worship. On the continuous broad tabling along the walls stand large boxes of roses as they come packed by the growers. The contents of others are deftly arranged in great heaps on the tables in front, which serve as counters. Other parts of the salesroom are used for carnations, violets, lilies, mignonette, smilax, lily-of-the-valley, with its poetical name here, as elsewhere, in the flower trade, cruelly abbreviated to "valley," with other flowers in season.

Passing into a middle room, which at this season is reserved exclusively for chrysanthemums, a new effect is witnessed. On side tables masses of immense flowers are grouped in deep mahogany-colored vases made of "Fibrotta," a preparation of wood pulp with a hardened shell and glazed surface. These tumbler-shaped vessels are eighteen inches deep and nine inches across at the top, but their ample size is needed for the tall stout stems and

the weighty flower-heads they support. In the middle of the room the floor is closely covered with open boxes, each containing twenty-five chrysanthemums—the long stems and their dark luxuriant foliage nearly filling the boxes, which are four feet or more long, half the blooms being at each end of the box, and especially choice and tender flowers separately wrapped in tissue paper. Last week in a collection whose quality suggested an exhibition for effect and for premiums, choice specimens of the new white Mayflower were, perhaps, the most sensational flowers. This variety and Nemesis, resembling the Daybreak carnation in its delicate pink color, commanded the highest prices of all. Flowers of Major Bonnaffon were also conspicuous among the best stock, and so were those of Philadelphia, the favorite new seedling of 1894.

The third room of this immense floor, which, in its length of two hundred feet, reaches entirely through to the Twenty-fourth Street front, is in a way even more interesting than the others. This apartment, which is not open to the public, is the receiving depot. A powerful elevator lifts the boxes after they are deposited on the first floor at this end of the building, where they are brought by immense vans direct from the growers' establishments, or by express wagons from railroad stations. The boxes measure about five feet in length and six inches in depth. Many are made of wood, the corners protected by zinc strips, and other metallic-looking ones, two feet deep, are of heavy-glazed papier-maché, iron-bound and securely strapped. The boxes are at once opened, the flowers examined and graded according to established standards, and a credit slip made out in the shipper's name, with memoranda of the kind of flowers, the number received, and whether of the first, second or third grade. The flowers are then passed into the salesroom or stored in great refrigerators, which are ranged along one side of the receiving-room in unbroken lines and have altogether a capacity of nearly five thousand cubic feet.

The New York Cut Flower Company, of which this is the home and business centre, is an organization new to this industry. It is not a trust, and does not attempt to regulate the business of its members, but it is a combination of some fifty commercial cultivators of flowers, who joined together to sell their products to wholesale buyers direct, instead of shipping, as heretofore, to commission houses. It has been estimated that the flowers sold on commission in this city in a year have a total value of one million dollars. If this is double the real sum, the fifteen per cent. charged by commission merchants would even then amount to \$75,000, and the combined growers thought they could get their flowers to the retailers for less money. At all events, they can now know definitely about the sales of their stock, and if reports come back to the effect that it is unsalable for some reason they can investigate the matter, as they could not do when the flowers had been sold on the old plan. The company includes members from this state, New Jersey, Pennsylvania, Connecticut and Rhode Island. More than ninety per cent. of the members use above twenty thousand square feet of glass, and some have glass houses which cover a hundred thousand feet. Many members are stockholders, and those who are not sign certain coöperative contracts, in which they agree to sell all their flowers through the company.

By this system of sales a large and complete assortment of cut flowers is concentrated, so that dealers can readily supply their varied needs in one place. Besides this, the very best growers are in the combination, so that the very best flowers of the season can always be found here. Other advantages claimed are that the flowers reach the consumer more quickly and are thus fresher, and that prices will be lower to consumers on account of reduced commission, since the combination sell for ten per cent. instead of fifteen per cent., and it is hoped that the lower commission will be still further reduced by dividends of profits. It is held that the grower under this plan comes into closer relation with his customers, and is, therefore,

better able to learn what the market demands—a condition which must redound to his own profit and the satisfaction of retailer and consumer.

The commission men, who see in the combination a most formidable rival and one that already controls the highest grade of flowers sold here, are not inclined to take so hopeful a view of the situation. They deny that it costs less money to get flowers to consumers than it did under the commission system. They affirm that the rent paid by the combination is more than the combined rent paid by all the commission dealers, and that when to this are added the salaries of several expensive officers, the alleged reduction of commissions vanishes. They hold that in an unequal partnership of this kind the large growers will ultimately get the profits and squeeze out the small ones; but they predict that the combination must fall to pieces. Prices must be evened up every day so that all receive the same for one grade, and the alert man who is on hand promptly to catch the top of the market, or the exceptionally good grower whose flowers are a shade better than the average of his class, loses the benefit of his superior enterprise and skill and shares it with his rivals. In short, they hold that the combination has already brought disaster upon growers; for the commission men, lacking the very finest stock, must cut prices to draw customers from the new company, and the company in turn cuts prices to meet the opposition, so that the retail dealer buys more cheaply than ever. The ultimate buyers, however, reap no advantage from this as the retail sellers are able to keep prices up, and in this way are reaping a rich harvest. The combination originally proposed to make prices for a week in advance and to make sales only to retail storekeepers. Experience has proved, however, that the company cannot maintain prices for any fixed time, and when the regular florists have secured their stock for the day the Greeks, who have sidewalk flower-stands all over the city, can get the advantage of an overfull market here just as they always have done.

All these foretellings on both sides are in the nature of guesses. Time alone will show whether the new plan is satisfactory in its practical working to growers and buyers. Every one hopes that the growers of flowers will receive an adequate reward for their labor and skill, and yet every buyer feels that the retail prices for cut flowers are often unreasonably high. Americans while they live in Paris, for example, learn to think choice flowers a necessity rather than a luxury, and they buy them there as regularly as they buy vegetables. Returning home the contrast in cost is marked. Roses which there can be bought for \$1.50 to \$2.00 cannot here be had for less than \$5.00, and even wealthy persons who are able to afford expensive flowers must think it a useless extravagance to pay \$3.00 for a bunch of fifty violets, a price not infrequently demanded here. The future must decide all such questions, but those interested in present facts may be told that of all the cut flowers now sent to this city for sale sixty per cent., and perhaps more, are received by the new company, and since it began business on the first of September an average of 100,000 flowers have been sold every day. Certainly it is to-day the controlling force in the cut-flower trade of New York and its vicinity. Its rather elaborate machinery seems to be moving with as little friction as could have been expected when it is remembered that the managers are conducting a business in which they have no experience and for which there is no precedent. Its founders are men of capital, of enterprise, of general business ability, and they ought to be able to adjust themselves to meet unexpected opposition or difficulties. Certainly, their large salesrooms and ware-rooms have that interest which a great business always commands when it is carried on with rapidity and system and precision.

New York.

M. B. C.

It is a sure evidence of the health and innocence of the beholder if the senses are alive to the beauty of nature.—*Thoreau*

New or Little-known Plants.

Berberis heteropoda.

THIS handsome Barberry of central Asia is an old inhabitant of the Arnold Arboretum, having been raised here first from seed sent from the St. Petersburg Botanic Garden in 1880. *Berberis heteropoda** (see illustration on page 455 of this issue) becomes in cultivation a vigorous shrub with stout spreading stems, usually unarmed or rarely furnished with stout simple or forked spines, and three or four feet tall. The leaves are broadly obovate, rounded at the apex, gradually narrowed into long, slender, reddish petioles, finely serrate, or often entire, pale bluish green, and paler on the lower than on the upper surface, from an inch and a half to two inches long and an inch and a quarter wide. The flowers are produced in few-flowered, long-stalked umbels, and are deep orange color, very fragrant, half an inch in diameter, and open about the middle of May, when the leaves have grown to nearly their full size. The fruit, which is produced sparingly in the Arboretum, ripens at the end of August, and is oblong, dark blue and covered with a slight glaucous bloom.

The pale color of the foliage of this Barberry, its handsome fragrant flowers and beautiful fruit make it one of the most distinct of the genus and a desirable inhabitant of our shrubberies.

C. S. S.

Foreign Correspondence.

London Letter.

ANECTOCHILUS SANDERIANUS.—Under this provisional name Herr Kranzlin describes a plant of which Messrs. F. Sander & Co. have imported a large stock from the Sunda Islands. There are healthy examples of it in the Kew collection, and although it is more than possible that it is not new to botanists I believe it has never before been in cultivation. It has very beautifully marked leaves, and in habit as well as foliage I should say it comes nearest to *Dossinia marmorata* (A. Lowii). The leaves are nearly ovate, fleshy, with a thin wavy border, the largest being four inches long; they are colored dark velvety green, with golden green reticulating veins, the under side being pinkish. Although this description would almost fit *Anectochilus petola*, yet there is really a wide difference between the two. At Kew there are good examples of about a dozen of the best of the *Anectochili*, including *A. setaceus*, *A. petola*, *A. Lowii*, *A. intermedia* and *A. Dawsonii*. Grown under bell-glasses they are very beautiful, perhaps the most beautiful of all variegated plants, but they are difficult to keep in health. There is a good, well-grown collection of them in the Blenheim gardens.

ONCIDIUM DICHROMUM.—This is the plant which Lindley described as *Odontoglossum bicolor*. It has lately been imported by Messrs. F. Sander & Co., and probably it has never been in cultivation before. Mr. Rolfe, to whom specimens were recently submitted, says it is a true *Oncidium*, and as there is an *O. bicolor* already he proposes to rename the newcomer as above. It is very like the beautiful *O. aureum*, but differs in having larger flowers and ovate pseudo-bulbs one and a half inches long, monophyllous, the leaf eight inches long and half an inch wide. The dried scape sent by the collector is stout, branched and apparently erect, and the flowers have a beautiful yellow lip nearly two inches in diameter, the sepals and petals being small and purplish brown, as in *O. aureum*. Lindley described it as having flowers large, bright violet, with a great whole-colored yellow lip with three strong equal curved teeth on the unguis, and gave Peru as its habitat. It promises to be

a first-rate addition to cultivated *Oncidiums*, of which *O. aureum* is one of the best.

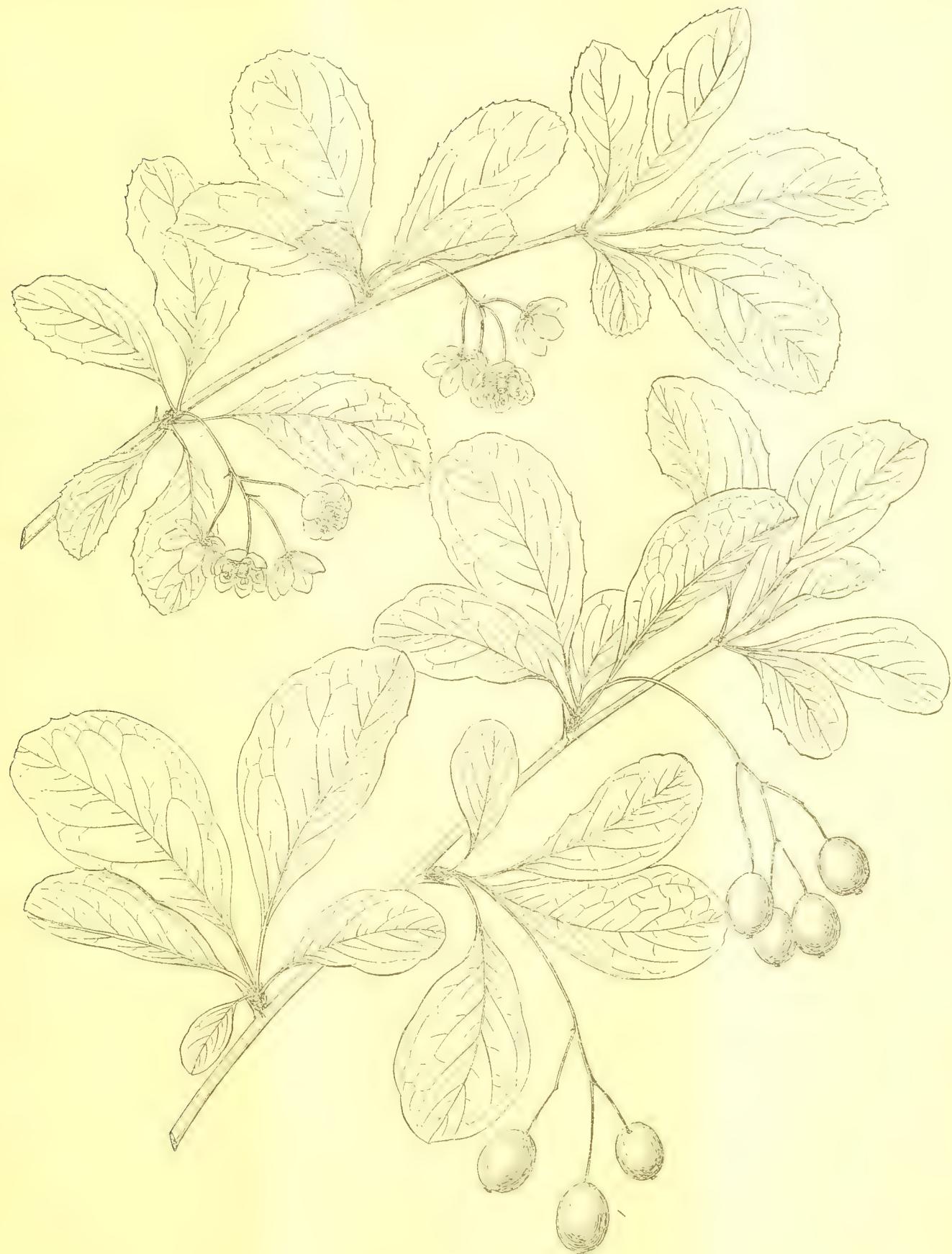
MASDEVALLIA FORGETIANA is a new species described by Herr Kranzlin and named after Mr. Forget, collector of Messrs. Sander & Co. It is small-flowered and, therefore, unlikely to interest any except ardent collectors of this curious genus. Herr Kranzlin says: "It is, perhaps, not a first-rate beauty, like many other *Masdevallias*, but it is, nevertheless, a nice little plant, and interesting as coming from Brazil. . . . It is, of course, a genuine tropical Orchid, and requires warmer treatment than the alpine species." In this respect *M. Forgetiana* resembles *M. Wendlandiana*, another small Brazilian species, which can be grown only in a tropical temperature. It is peculiar in being deciduous, all the leaves falling off in winter, a peculiarity which has resulted more than once in the plant being thrown on the rubbish heap as dead. With these two exceptions all the *Masdevallias* require cool treatment.

EPISCIA DENSA.—This is a new and promising addition to the cultivated species of *Episcia*, of which *E. erythropus*, *E. fulgida*, *E. Chontalensis* and *E. metallica* are generally grown, the last three being known as *Cyrtodeiras*. *E. densa* is a native of British Guiana, specimens of it having been sent to Kew by Mr. Jenman, of the Georgetown Botanic Garden. It was described by Mr. Wright in the *Kew Bulletin* in January last, and plants of it are now in flower in a stove at Kew. It has a woody stem six inches long, supporting about a dozen spreading oblong acuminate leaves, the petiole four inches long, the blade eight inches by four, glossy olive-green above, crimson-purple beneath. The flowers are numerous on short axillary racemes, forming a cluster about the bases of the leaves; the calyx is crimson outside, green within, and the tubular corolla is two inches long, pale yellow, covered with glistening silky hairs. The plant grows freely in an ordinary stove, is attractive in leaf as well as in flowers, and is as easily multiplied as a *Gloxinia*.

STAPELIA GIGANTEA.—If all the *Stapelias* were as easily cultivated and as strikingly handsome as this is the genus would take front rank among popular plants for the greenhouse. It is difficult to overcome prejudices against plants, and there exists among horticulturists a strong prejudice against *Stapelias*, begotten of the dull colors and bad odors of the flowers of many of them and their bad behavior under ordinary cultivation. But in *S. gigantea* we have an exception to all this. As I have said, the plant grows with freedom when the treatment is right, and this is nothing more than obtains in any plant-stove. Its flowers are great fleshy stars a foot in diameter, pale yellow, with short brown lines, the surface wrinkled and covered with soft silky hairs, altogether a most unflower-like flower. As for the odor—well, it is strong and disagreeable if one is too curious—but the flowers may be seen and enjoyed at a short distance and the odor not perceived. Several big pans of this plant have flowered freely at Kew during October; one, grown in a ten-inch pan suspended from the roof of a stove, was a mass of shoots, and bore five open flowers on one day, with many buds in various stages of development.

A FIRST-RATE BANANA.—The best Banana grown at Kew—and I believe all the reputedly best sorts have been or are grown here now—is one which is known as "Ram Kela," an Indian name for *Musa sapientum*, var. *rubra*. It has a very tall, stout, reddish stem, equally large leaves, suckers freely, and its branches are as large as those of *M. Cavendishii*. The fruit is six inches long, six inches in circumference, nearly straight, with five slight longitudinal ridges; the skin is dull orange-red, or yellow, tinged with red, when ripe; the flesh is apricot-yellow and delicious in odor as well as in flavor. Each fruit weighs from six to seven ounces. This description does not quite agree with that published in the *Kew Bulletin*, prepared from Indian specimens. There the fruit is said to be seven inches long and rather thin, its flavor surprisingly rich and luscious and its flesh of buttery consistency. There are apparently as

* *Berberis heteropoda*, Fischer & Meyer, *Enum. Pl. Nov.*, Schrenck, i., 102 (1841).—Karelin & Kirilow, *Enum. Pl. Songor.*, No. 48.—Ledebour, *Fl. Ross.*, i., 742.—Regel, *Act. Hort. Petrop.*, ii., 418.
Berberis vulgaris, Falk, *Beitr.*, ii., 163 (testa Ledebour, l. c.) (not Linnæus) (1786).—Hort. Kew.
Berberis spærocarpa, Karelin & Kirilow, *Enum. Pl. Alt.*, No. 46 (1842).

Fig. 63.—*Berberis heteropoda*.—See page 454.

many varieties of Bananas as of Apples, but one may easily get hold of inferior sorts, although the best are as easily cultivated, and it ought not to be difficult to find them.

MR. A. F. BARRON.—After having filled the post of superintendent of the gardens of the Royal Horticultural Society

for thirty-five years Mr. Barron is about to retire. He has conducted the work of the gardens and the many big exhibitions held by the society with conspicuous ability, and by his urbaneness and good nature he has won the good opinion of all who have had dealings with him. He has

written and published a standard work on the cultivation of the Grapevine and some valuable statistics and cultural information on the Apple. The Royal Horticultural Society propose to provide him with a liberal pension, and his many friends and admirers have started a testimonial fund as an expression of their feelings toward him. I am not aware if a successor to Mr. Barron has been found, though the society advertised for one a few weeks ago. I believe it is proposed to reorganize the Chiswick gardens and conduct them on somewhat different lines from those hitherto followed.

MR. C. F. BAUSE died on October 23d, after a long and painful illness. He has long been recognized in England as one of the cleverest cultivators and hybridizers of indoor plants. He was a German, and came to England in 1863, soon afterward entering Chiswick, where, in 1866, he raised some beautiful Coleuses, six of which were purchased by Messrs. J. Veitch & Sons for \$1,250 (£250). He also raised many fine Caladiums, and was the first to succeed in artificially hybridizing Ferns—namely, *Adiantum Bausei*, *A. rhodophyllum*, *A. reflexum*, *Nephrolepis Bausei*, etc. His wonderful success in raising new forms of tropical Dracænas, Cordyline terminals vars., was, perhaps, his greatest or, at any rate, most profitable achievement in this line. I never saw better cultivation than he accomplished with all kinds of stove-plants. He was a modest, quiet, lovable man, always ready to impart useful information and to encourage young men. For some years he conducted a large market nursery at South Norwood, where only two years ago he raised a batch of new Caladiums which were secured by Messrs. J. Veitch & Sons.

London.

W. Watson.

Plant Notes.

GINKGO BILOBA.—The Ginkgo is certainly one of the best of the trees for which our parks and gardens are indebted to Asia. It is not known in its wild state, but about the temples of Tokyo broad-branched specimens a hundred feet high, with trunks six or seven feet in diameter, are as interesting as any of the trees which one sees in Japan. Some of the trees which were planted in this country early in the century, notably the fine specimen planted by Dr. Hosack at Hyde Park, have taken on the peculiar form which they assume at maturity, in which the curved and partly pendulous branches assume an entirely different appearance from the rigid and formal look of the tree when young. This rather strict habit prevents the tree while young from grouping with other trees, but especially adapts it for association with architecture and makes it very valuable as a street-tree. Besides this, the tree grows rapidly; its drupe-like fruit, hanging at the end of long stems, makes a striking ornament; it has few fungal diseases and it endures the dust and smoke of a city exceptionally well. Its autumn coloring, however, is the point which we wish to emphasize at this season. In one of the streets of Jersey City there is a healthy young Ginkgo, some thirty feet high, and while the leaves have all been swept from the neighboring trees by the winds and rains, the foliage still adheres to this one, and it is a rich, clear yellow, and the tree, as it glows in the sunshine, is certainly a magnificent object.

PHOTINIA VILLOSA.—Two forms of this variable plant have been figured in GARDEN AND FOREST (see vol. i., page 67, and vol. iv., page 377). In their minor characters, such as the shape of the leaves, the character and amount of their pubescence and the size of their flowers, the extreme forms of this species differ quite widely, but they are all interesting for their white Hawthorn-like flowers, which appear in corymbs in June, for the bright red oblong fruit in October and for the glowing scarlet of their foliage, which persists well into November. In fact, these latter qualities give a distinct value to this shrub or small tree, and in even a select list of trees and shrubs selected for their appearance at this season, the Photinia would be included. The form with smooth and comparatively narrow leaves

sometimes loses the ends of its branches in the winter in New England, but it seems to be perfectly hardy in this latitude, and its fruit and autumn foliage are rather brighter in color than the form with broader and more pubescent leaves. The flowers are smaller, however, and the habit is less compact, and, altogether, it is hardly as desirable a garden-plant as the stouter form.

DICHORISANDRA THYSIFLORA.—This is an old and interesting Brazilian plant of the natural order Commelinaceæ, nearly related to the Tradescantias. It is as beautiful as it is rare, and deserves to be better known, especially as it is easy to grow. Like the Tradescantias, it is well adapted to house-culture. It blooms during fall or early winter, and the large showy flowers remain long in perfection. The leaves are sessile and sheathing at the base, about ten inches long, oblong, with an acute apex, very dark green, with a metallic lustre; alternate and crowded at the top of the shoots. In October, or sometimes later, the flowers appear in a terminal thyrsoid raceme; they are of a deep, pleasing blue color, with showy yellow anthers. The plant is one of the best of the family for flowers, growing to a height of four or five feet, or even more, branching at the base and forming fine masses of foliage. It grows well in a rich vegetable soil and a temperature of about seventy degrees. The propagation by means of cuttings is as easy as that of most Tradescantias.

Cultural Department.

Fern Notes.

SMALL plants of Ferns for decorative purposes are in increasing demand, and the gardener often finds it no easy matter to keep up the supply. The most convenient method of propagation is by spores. It is true that it is difficult to raise some varieties by this means, and some cannot be raised from spores at all, but these varieties, as a rule, are too delicate for decorative use, and there is quite a good selection of suitable sorts. A few of these are *Adiantum cuneatum* and its varieties, *A. decorum*, *A. pubescens* and *A. Pacottii*. The neat and compact habit of the latter variety makes it especially valuable when small. *Cyrtomium falcatum*, which is sometimes called the Ivy Fern, on account of the resemblance of its first course of fronds to that of Ivy leaves, makes useful plants in small pots. Many of the Lastreas may be utilized. *L. Richardsii multifida* is one of the most useful. *Gymnogramma chrysophylla* (golden) and *G. tartarea* (silver), *Lomaria Gibba*, *Nephrolepis acuta* and *N. exaltata* are all well adapted. To the Pteris family we are probably indebted for more good decorative varieties than to any other, and they probably stand more rough handling than any Ferns we have. *P. serulata* and its crested variety *P. serulata cristata*, *P. Cretica nobilis*, *P. Cretica alba lineata*, and the newer crested and variegated *P. Cretica Nayii* may all be used to advantage. *P. tremula* is, perhaps, a little coarse, but a few plants of it can always be used in collections. The crested variety *P. tremula Smithiana*, on account of its more compact and bushy habit, is preferable to the old form. Although it does not yield spores as freely, one can generally find a few fertile fronds on the two-year-old plants, but it seldom throws spores the first year. In selecting the spore-bearing fronds it is necessary to watch them pretty closely to catch them at the right time. The surest indication of ripeness is when a few of the spores can be shaken from the frond. After being cut, the fronds should be wrapped closely in paper and laid aside in a dry warm place for about two weeks, when the spores can be readily shaken from the fronds and sown as required. Most spores will keep for several months, providing they are properly wrapped up and not subjected to dampness. We generally sow a few pans at this season for the main supply for next summer and for larger plants for winter use. *Adiantums* from this sowing will give nice bushy plants in five-inch pots by next fall, while *Pteris serrulata* and its allied varieties will give plants twelve to fourteen inches high in six-inch pots. *P. tremula*, being stronger-growing, would fill seven-inch pots and give plants eighteen inches high during the same period.

The plants in being used for house decoration suffer more or less severely, and we usually throw them away after they have been thus used, finding it better and easier to keep up a stock of young plants than to try to revive the old ones.

It is desirable to keep the plants as compact and bushy as

possible, and the soil should be light and not overrich. Only enough shading should be provided to prevent them from getting scorched. They can be kept in a small state by confining them to small pots, but this is by no means a good plan, as it causes them to assume a stunted and sickly appearance.

William Scott.

Tarrytown, N. Y.

Half-hardy Shrubs.

THREE are quite a number of showy-flowered shrubs which might be grown in the northern states with a little protection out-of-doors in winter; when that is not sufficient they can be lifted bodily and stored in a deep frame where they will get light and air occasionally. *Abelia floribunda* and *A. rupestris* are two shrubs belonging to this class well worth this extra attention; they flower very abundantly all through the summer months and late into the fall; they are not particular as to soil, and will flourish even in very dry weather. During the past summer I saw a good-sized bush of *A. floribunda* at Dosoris, Long Island, loaded with flowers, which I was told was moved each fall with other things to a place where it got the protection of a few boards.

The Chinese Crape Myrtle, *Lagerströmia Indica*, is another shrub which is too little known and grown in the northern states. As a proof of its rapid growth I will say that we had some plants of it in bloom this fall which were raised from last year's seed. Old established plants stand several degrees below zero safely, and young ones, if protected with some rough material over the roots, although killed to the ground, will come out safely in the spring, even where the cold is much more intense, and flower profusely. Medium-sized bushes can be moved to a safe shelter each fall and replanted in the spring without suffering much from the operation. This species, with its different colored forms, are represented in the vicinity of Washington by bushes twenty-five feet high.

Hypericum patulum and *H. Mosserianum* occasionally get nipped here, but they stand the removal treatment well. All the varieties of *Vitis Agnus-castus* are good plants for dry soils; its leaves and flowers are both attractive, and it will grow from cuttings four feet in a single season. *Rhaphiolepis Japonica integrifolia*, a leathery-leaved rosaceous shrub with sweet-perfumed Hawthorn-like flowers, is quite hardy in Washington, and so is the Japanese *Photinia serrulata*, a very handsome shrub with Laurel-like leaves. If planted in sheltered situations this ought to thrive much farther north. [This *Photinia* is hardy in New England. See GARDEN AND FOREST, vol. i., page 67.—ED.] Although more in the nature of an herbaceous plant, *Caryopteris Mastacanthus* is really a sub-shrub, and it should have a trial everywhere, as it stands drought well and flowers very abundantly even on the small twigs. Being easily propagated, the old plants can be left out for trial, protected if necessary, and young plants kept in a cool frame. [*Caryopteris* survives ordinary winters in the latitude of Boston. See GARDEN AND FOREST, vol. vii., page 406.—ED.]

The common Indian Azaleas are much hardier than many people suppose; a bed of them has stood unprotected during twenty years in Washington, where the mercury frequently gets to the zero point. They are planted in a mixture of leaf-soil and sand partly in the shade of some tall Oak-trees, the leaves of which are allowed to remain on the ground where they fall. *A. amceana* is perfectly hardy in some of the northern states. This is a very beautifully flowered shrub, and should be more largely planted. There are several very pleasing hybrids between this and *A. Indica*. In likely situations they should all be given a trial. The stronger-growing, single-flowered varieties of *A. Indica* give the best results.

Botanic Garden, Washington, D. C.

G. W. O.

The Winter Cantaloupe.

IT is not generally known that there are several varieties of Cantaloupes which are distinctively slow in ripening, and may be some months in doing so after they have been pulled from the vine. We know this to be true with regard to some apples and pears, some of which require several months before they are fit to eat. They are put away in their green state, and after a longer or shorter period, by some hidden process, become mellow and ripe. The cantaloupe is generally so perishable that it lives only from one to three days after it has been separated from the plant, and can be transported but a few hundred miles.

But there are winter varieties of the melon that can be kept like apples or pears and will ripen in November and along until the last of winter. We know of four varieties of the win-

ter Cantaloupe, two of which are credited to the vicinity of Naples and two to the island of Malta. The Naples green-fleshed is probably the largest and finest of the four, and, strange to say, grows in swampy land. The fruit has large brown seeds and sells in Naples at from forty to sixty cents apiece. In the fall the melons are stored away, and when one is to be ripened it is hung up in a net in the air. In our country, it being too cold, the fruit can be ripened in a room where it is not exposed to the frost. In Naples this variety can be kept from Christmas to Easter, and is said by foreign visitors to be a fine melon.

All the winter melons are long, oval, of a green color, with no network, or merely a trace of it, and weigh from three to four pounds. The Naples varieties are either green-fleshed or white-fleshed, and the Malta kinds are red-fleshed or greenish white. The latter is sometimes known as the Spanish winter melon, and has recently been imported into New York from Cadiz, in Spain. As these melons grow near Naples, in the island of Malta, in the south of France and in Spain, there is no reason why they should not be grown in our southern states and in California. We have introduced the Japanese Plum and Persimmon, why not the Winter Cantaloupe? Damman & Co., of Portici, near Naples, can furnish experimenters with the two Naples varieties, and the Malta kinds can be had of Vilmorin-Andrieux et Cie., of Paris. Any good seedsman will import them for customers. This new industry is worth trying in Georgia, Florida, Louisiana and southern California.

Philadelphia, Pa.

Robert P. Harris.

[In Bulletin 95 of the Cornell Experiment Station on growing Melons in winter, one section is devoted to Winter Melons for field cultivation. These interesting Melons, the *Cucumis Melo*, var. *inodorus* of Naudin, are little known here, although their long-keeping qualities make it possible to send them across the Atlantic, and there has been considerable importation of the fruit here this year. These mostly belong to the variety known as the White Antibes, a large, hard-shelled, bright green, egg-shaped and very long-keeping melon, which has the characteristic odor of the muskmelon, and when properly ripened a good flavor. It belongs to the type which has a soft interior and loose seeds like ordinary melons. Another type, including the Winter Pineapple, or the Green-fleshed Maltese Melon of the French, has a solid interior like a cucumber, with the seeds imbedded firmly in the structure of the fruit. For field cultivation the Winter Melons require a long season, and should be picked just before frost and before they have become edible.—ED.]

Aralia Veitchii—This Aralia, together with *A. elegantissima* and *A. Kerchoviana*, forms a trio of highly ornamental stove-plants which are much prized by cultivators of the finer-leaved plants. Owing to the difficulty of propagating them by cuttings, they are not much grown commercially. As we commonly see them they have digitate leaves, with from seven to eleven very narrow leaflets of a bronzy green color. A plant of *A. Veitchii*, said to have been the first one imported into this country somewhere about thirty years ago, was planted out in one of the conservatories here, where it has remained ever since. It has grown to a height of over twenty feet, and the stem at the base is twelve inches in circumference. Visitors when they see this specimen for the first time find it difficult to believe that this is the true *A. Veitchii*. Its whole appearance is changed; instead of the wiry upright stems and graceful foliage the smallest of the branches are at least half an inch thick and assume more of a pendent than an upright habit, while the leaves have changed still more. They have become a dark shining green, and the leaflets are at least one and a half inches broad, entire at the margins, with three or four undulations along their entire length. It is only where a large branch of this plant is cut back to near the principal stem that the typical characters of *A. Veitchii*—that is, shoots with narrow leaflets—are seen. These shoots grow quite rapidly, and are used for grafting on the common *A. Guilfoyliae*, to which they unite readily.

Botanic Garden, Washington, D. C.

G. W. O.

Cucumis dipsaceus.—I have lately received from one of our great seed houses the fruit of this Arabian and African species. It has been somewhat cultivated in this country under the name of the Ostrich-egg Gourd, but, unfortunately, so far as I know, it is described in none of the current botanical works,

not even in Nicholson's *Dictionary of Gardening*. The plants grow like Cucumbers, the vines being six or seven feet long, and the fruit oval in form, about two and a half to three inches in length and one and a half inches in diameter, including the spines. These latter are thickly placed upon the surface, and vary from one-fourth to five-sixteenths of an inch in length. They are soft greenish yellow in color, and give the fruit the appearance of being rather thinly studded with very coarse hairs. The surface of the pericarp is of a light green color, tinged with yellow. This fruit has no edible qualities, so far as anybody knows, but is cultivated as are twenty-five or thirty other species, simply for its curious appearance.

Cornell University.

L. H. B.

Correspondence.

Keeping Grapes Fresh all Winter.

To the Editor of GARDEN AND FOREST:

Sir,—In your issue of the 9th of October, under the title "Lake Keuka Vineyards," it is stated that "table grapes are shipped all through the winter months until March and April, now that the art of keeping them is understood." Will you have the goodness to publish the method alluded to, as it would be of great value to your readers on this coast?

San Francisco, Calif.

John Benson.

[There are but few varieties of grapes which can be kept through the winter, even under favorable conditions. The Catawba is the standard winter variety in western New York, and Mr. G. C. Snow, of Penn Yan, New York, who was the Commissioner of Viticulture for that region at the World's Fair, writes that this fruit is picked a few days before it is dead ripe—experience must tell the exact time—and the clusters are laid on trays holding about forty pounds of fruit. The fruit is cooled as soon as possible to a temperature of some forty-five degrees, either in a cellar or on the cold side of a building where it can be exposed to the night air; in the easiest way, in short, that it is possible to reduce it to the proper temperature. The trays are then placed in a cellar or storeroom where variation of the temperature can be prevented as far as possible. Ventilation is necessary in order to get rid of the stale air, and care must be taken that the air in every part of the cellar is changed, but draughts must be avoided, or there will be a tendency of the stems to shrivel. These are the main points of the process, about which there is no secret. Expensive buildings are not essential, for, as a matter of fact, it is only by testing that it is discovered whether the cellar is good for the purpose or not. Mr. Snow adds that some of the most successful houses for keeping fruits are inexpensive, and he does not know of a single cellar for this purpose alone in which ice is used. It ought to be added that Mr. Snow had on exhibition at Chicago, Catawba, Diana and Isabella grapes of the harvest of 1892 up to August 1st of the following year and enough fresh grapes in good condition to have lasted a month longer, when they were destroyed by the burning of the cold-storage building. He expected to show fresh grapes twelve months old, and would probably have done this but for the fire.—ED.]

Late-flowering Golden-rods.

To the Editor of GARDEN AND FOREST:

Sir,—A kindly word for the Golden-rod is always appreciated, and your reference to a late-flowering species, on page 440, suggests the query, why not have other of the species flower at this season? By accident we found this to be easily done. Last year the wife of a Long Island farmer called my attention to a clump of *Solidago Canadensis*, in the corner of the garden where it had been allowed to remain undisturbed for a number of years, that had been cut nearly to the ground by the scythe, but had branched out anew and was flowering beautifully the last week in October. This year the operation was repeated, systematically, a portion being cut early in June, another just as the plants were coming into flower, the result being that there were flowers until quite recently. Whether this plan will always work, and whether other of the species will do as well under the same treatment, I cannot say, but shall experi-

ment further another season, and trust others may do the same.

Floral Park, N. Y.

C. L. Allen.

Exhibitions.

The Horticultural Show in Philadelphia.

THE Academy of Fine Arts in Philadelphia afforded a convenient and beautiful exhibition place for the autumn show of the Pennsylvania Horticultural Society last week. The display was, perhaps, more remarkable in tasteful arrangement and in variety of exhibits than in any other particulars. The broad marble stairways were tastefully, but not lavishly, decorated with plants, and the long hall at its head, between the half-dozen connecting rooms on each side which contained the main exhibits, was lined with well-grown, single-flowered Chrysanthemums, in classes of six pots each of five different varieties and of twenty-five plants of twenty-five varieties. C. W. Cox, gardener to Clay Kemble, Esq., Glenside, Pennsylvania, took first premium in both these classes.

Specimen plants were arranged about the group of centaurs in the rotunda. Among them the prize plant of a variety not disseminated prior to 1895, which was an unnamed pink seedling of good color and quality. The plants throughout were in unfavorable contrast with the magnificent specimens familiar in 1892 and several years previous, when James Verner, then gardener for the late A. J. Drexel, Esq., showed how much may be accomplished by perseverance and skill, and, it should be added, by the unlimited use of money. The largest premiums for plants in pots, \$130 altogether, was offered for collections of five plants, five varieties, and the first prize went to plants of Mrs. Frank Thompson, Mrs. Hicks Arnold, Puritan, Good Gracious and a pink seedling. The best white-flowered specimen was a plant of Queen, the best yellow of W. H. Lincoln, and the best of any other color Mrs. Hicks Arnold. In the list of special prizes offered by individuals, the *Record* prize for best three plants, yellow, three varieties, was given to plants of Georgianna Pitcher, W. B. Dinsmore and W. H. Lincoln, the first-named being the finest plant in the exhibition. A plant of Mrs. Frank Thompson, ranking second best, took the Corkerhill prize. Plants of Gettysburg, Ada Prass, Minnie Wanamaker and Mrs. Frank Thompson won the Pembroke prize for the best four Japanese varieties. In all these classes first prize was won by Gordon Smirl, gardener to Joseph F. Sinnott, Esq., Rosemont, Pennsylvania. Other first-prize winners for plants were John McCleary, gardener to William Weightman, Esq., and Patrick Conlan, gardener to N. Z. Graves, Esq.

The exhibition was rich in cut flowers, many of which were generously furnished for display only, and not entered for competition. The Chrysanthemum receiving the greatest number of awards was the new seedling first labeled Quaker City, but since named William Simpson, originated by Joseph Heacock, Wyncote, Pennsylvania. This silver-pink variety is similar in character of petals and in form of flower to Philadelphia, the blooms generally being of great depth. It is the largest pink Chrysanthemum yet produced, and some of its flowers have measured as much as eleven inches across. The one adverse criticism is that the stems within about ten inches of the flower have scant foliage. It received a silver medal and a certificate of merit and first premiums in various classes. Mrs. Perrin, Mr. E. G. Hill's new pink, which recently scored one hundred points of merit in New York, received first premium for the best fifty pink cut blooms. The specimens shown here resembled Ivory in form. They were of uniform, medium size, broad petals, of not very heavy texture, loosely and regularly incurved; in color the clearest and brightest pink yet seen. The foliage was in all respects excellent. These two pink varieties were the conspicuous new sorts of this show, as Philadelphia was the noteworthy flower last year, Eugene Daileddouze in 1893, and Golden Wedding and Mrs. Craige Lippincott in 1892. Three notable vases of fifty white flowers were of Mayflower, Mr. John May's striking seedling of last year, grown by Mr. Robert Craig, and of Minnie Wanamaker and Ivory. The prize for twelve blooms, one of a kind, open to amateurs only, was won by J. E. Krayer with flowers of Queen, Mrs. Bayard Cutting, Harry Balsley, Mrs. W. Trelease, a pleasing pale pink, loose and feathered; Mrs. Craige Lippincott, H. Sunderbruch, Colonel William B. Smith, Minnie Wanamaker, Philadelphia, Mrs. A. J. Drexel, Golden Wedding and Imperial Castle, an improvement on the old white, spherical Mrs. George Bullock. Imperial Castle again showed to advantage in the amateur's exhibit of twenty-five blooms, one of a kind, in which also appeared the best bloom of Eugene

Dailedouze in the show, one of the rarely seen Mrs. Alpheus Hardy, and a fine flower named E. G. Uihlein, a good yellow, with bronze marking inside of petals and faint striping of bronze outside. Mr. Krayer also received first premium in this class. First premiums in the amateur class were also won by John T. Harrison, gardener to Craige Lippincott, Esq., and by C. W. Cox, gardener to Clay Kemble, Esq. Fifty vases of a half dozen flowers each contained many good blooms, but interest in these was marred because no names were attached. This effective group was not in competition, and came from John Cullen, gardener to Percival Roberts, Jr., Esq., Pencoyd, Pennsylvania.

In the class of twelve blooms, one of a kind, open to commercial growers only, Mr. Hugh Graham's prize lot contained a striking flower of Minerva, one of Charles Davis, resembling Viviand-Morel, its twisted petals a silver terra cotta color tipped with yellow. In the class of thirty-six blooms, three each of twelve varieties, the pink Katherine Leech showed well, as it did generally. The feathery white Enfant des Deux Mondes was also noteworthy. In a similar class the deep chrome-yellow, Louise D. Black, was conspicuous, a globe-shaped flower, seedling of last year, originated by Mr. E. G. Hill. Minerva, Mr. May's seedling of 1894, was also in this lot, and proved its value in the many beautiful flowers seen throughout the exhibition. Other winners of first prizes in these classes were Joseph Heacock, John N. May, Samuel J. Bunting and C. F. Evans. A worthy collection, not entered in any class, was shown by John Curwen, Jr., Villa Nova, Pennsylvania.

The best flowers of Philadelphia, the prime favorite of last year's show, were exhibited by Edward Jones, gardener to J. W. M. Cardeza, Esq., and by Joseph Monaghan. These were very large and white, in striking contrast with all other specimens of this variety, which were of medium size and a distinct lemon color. It must be said for this variety and for many others, that the season is a week late, and the flowers were not fully matured and at their best. A remarkable flower was Mr. Robert Craig's yellow sport of the white Enfant des Deux Mondes, altogether a pleasing acquisition and better than the type. The color is distinct and even, a delicate canary; the flower full, of medium size, with no suggestion of coarseness, all softened by an abundant pubescence, an excellent flower for table decorations.

Some buds of Kaiserin Augusta Victoria showed remarkably successful cultivation, and Pearl was still the best yellow in a collection of Roses, which comprised good flowers of all the standard and newer sorts. Robert Craig, Charles F. Evans, George Anderson, Hugh Graham and Edward Rieger won first prizes for Roses. Among Carnations, William Scott was the winning dark pink, and Della Fox, of the lighter pink sorts, took several first premiums with cut flowers and vigorous plants. The fragrant Maud Dean, Lena Saling, Helen Keller and Eldorado were all good, as were also Alaska and Adelaide Kresken, the rose-pink western variety. Annie Lonsdale, a white flower of the highest grade, was shown for the first time, the flowers larger than those of Ada McGowan. John Welsh Young, Myers & Samtman, Hugh Graham and the Penn Rock Company were the successful competitors with Carnations. An exhibit of a dozen varieties of new French Violets, all grown in the open, was shown by Francois Supiot and took first premium. Two exhibits of Orchids filled an entire room. Mr. Edward Lonsdale's large collection was arranged with graceful effect, and that of Dr. William H. Furness, Wallingford, Pennsylvania, comprised many choice species and varieties in abundant flowering. The mantel and table decorations were popular attractions, the latter judged by a committee of well-known women, patrons of the society, Mrs. J. F. Lundy, Mrs. Charlemagne Tower, Mrs. Stuart Patterson and Miss Maria Blanchard.

The gay color of the flowers was judiciously relieved by foliage plants, and in this class prizes were taken by Mr. Robert Craig, John Whittaker, C. W. Cox and Wescott's Laurel Hill Nurseries. Two large collections of choice Ferns were those of J. E. Krayer, gardener to W. E. Garrett, Esq., and John Whittaker, Wallingford, Pennsylvania. One of the most showy and yet chaste and elegant features was a large display of medium-sized plants of Adiantum Farleyense, from Mr. Henry A. Dreer. The healthy luxuriant foliage, ranging from rich deep green through many lighter shades into pale pink, was delightful and refreshing, and the effect of this extensive collection was heightened by simple arrangement in artistic bowls. Fifty kinds of decorative evergreen plants were shown by the William H. Moon Company.

About one-fourth of \$4,000 in premiums was offered for fruits and vegetables alone, a new experiment which added much in

interest and beauty, and the fragrance of the large room assigned to fruits was not less rich than of those given over to more æsthetic exhibits. Showy collections of apples from J. M. Kaighn, Charles Wright and James H. Bull won premiums, and magnificent grapes from Gebhart Huster, Mr. Bull and Mr. C. C. Corby were similarly honored. Messrs. Ellwanger & Barry's collection of pears comprised seventy varieties, many of unusual size and beautiful coloring.

A collection of remarkably clean and smooth roots grown from Dreer's seeds by R. C. Kaighn, Ellisburg, New Jersey, won first premium. Eighty-five varieties of forty-two different kinds of vegetables grown out-of-doors and in cold frames, from Buist's seeds, secured a prize of \$100 for John McCleary, gardener to William Weightman, Esq., Germantown. An entire room was given to products from Michell's seeds, where, besides staple vegetables of good quality, many curious ones were shown. Prizes offered by W. Atlee Burpee & Co., for vegetables grown from their seeds, were awarded to R. C. Kaighn, C. W. Cox, R. B. Plumly and R. James, for excellent specimens in seven classes.

In the absence of remarkable exhibits, such as those formerly made by A. J. Drexel, Esq., George W. Childs, Esq., and Miss Baldwin, which in themselves were sufficient to make a noteworthy show, this year's exhibition was altogether creditable and interesting. The picture-lined walls and the statuary disposed in the halls made effective foils, and were a welcome change from the usual autumn foliage and evergreen decorations. Since the first exhibition of the society in 1828 these annual shows have occurred regularly in various places, those of 1855 and 1856 in a tent in Penn Square, the site of the present municipal buildings. Interest has not flagged since the destruction by fire of Horticultural Hall in 1893, and a year ago the society created, besides sections on decorative plants and flowers, those on vegetables and small fruits, plant-foods, insectivora and fungous diseases, forest and fruit trees, farm and dairy, subjects which were discussed at the monthly meetings during the year. The new home of the society is well advanced, and its opening is arranged to occur simultaneously with the next Chrysanthemum show. The building will cost nearly \$250,000, the ground being valued at \$300,000 more.

The Boston Chrysanthemum Show.

THE exhibition of Chrysanthemums held by the Massachusetts Horticultural Society in Boston last week attracted the usual crowd of visitors, and it was certainly not inferior either in quality or in arrangement to any of its predecessors. While the leading exhibits showed no marked advance, there were fewer poor flowers shown than on some former occasions, and throughout it was of high average quality. The number of specimen plants was smaller than in previous years, but their absence was more than made up by the masses of smaller plants grouped with Palms and Ferns for decorative effect. The prize for the best twelve specimen plants went to Mr. N. T. Kidder, of Milton (William Martin, gardener), who exhibited the largest plants ever seen here, although they were not the most highly finished. The best of them were Iora, pink; Portia, pink; Superbaeflora, pink; Golden Hair, light bronze; and the crimson John Shrimpton, probably the best single plant in the room. The plants exhibited by Mr. Walter Hunnewell (T. D. Hatfield, gardener), were probably the most even lot ever exhibited by him—low plants, good shape and finish and effective in their arrangement of color. Among the plants were Columbine, a fine bronze; G. W. Childs, crimson; Louis Menand, bright red; Octavie Mirabeau, a delicate pink; Louis Boehmer, pink—a strikingly good plant; Ivory, a perfect globe of white; and Clinton Chafant, an exquisite yellow. Dr. Weld, of Brookline, had some plants in six-inch pots with a single large flower to each, which were superbly grown, the plants being only about two feet high and the flowers of the largest size.

The usual gigantic single flowers were displayed in greater abundance than ever, and bunches of these on long stems in large vases produced magnificent decorative effects. The most remarkable of these bunches were from the garden of Mr. John Simpkins, of Yarmouthport (James Brydon, gardener), one being composed of the pure white flowers of the Queen, and the other of varieties in different colors. A remarkable exhibit was made by E. M. Wood & Co., of Natick, in the form of a row of nine vases, each carrying ten specimen flowers of one variety. In this collection especially good were the pink Viviand Morel and the yellow H. L. Sunderbruch, while Inter-Ocean, Philadelphia and Robert McInnis were also noteworthy. There were comparatively few Pompon or Anemone-flowered Chrysanthemums shown. These plants

do not seem to be attractive to growers or to the general public, although many of them are very interesting. Of the new seedlings probably the best was Mrs. Perrin, shown by E. G. Hill, of Richmond, Indiana, which is a counterpart of Ivory in form and texture, but of a bright rose-pink, remarkable for its decided color and freedom from any shading. Besides the exhibitors named, Mrs. B. P. Cheney, Joseph H. White and J. W. Howard took many of the prizes in the different classes.

Individual flowers on single-stemmed plants were here in their usual profusion, variety and size, but, marvelous as is the skill which succeeds in growing one flower of monstrous proportions upon a young Chrysanthemum plant, it is a question which many people of taste would answer in the negative if they were asked whether these enormous blooms are really as beautiful as those produced in a more natural and normal way. They indicate what a skillful gardener can do, and they are effective in large decorations, but they are not only expensive to raise, they are distinctly coarse. Such specimen plants as are often shown in our exhibitions now are certainly marvelous examples of cultural skill. To produce a dozen such plants, however, as those which win first prizes at our best exhibitions, requires the constant labor for months of a skilled gardener and the exclusive use of a large greenhouse. The plants remain in flower for two or three weeks, and that is the end of them. They are then thrown away, and the operation has to be gone through with again the next year. The same amount of care and labor devoted to hard-wooded plants would, in a few years, produce great results in plants that would go on increasing in beauty and value for half a century, and would be, of course, of real permanent value. Chrysanthemums are easily raised, and they bloom at a season when flowers are scarce and in demand. They have attained in this country a greater and more widespread popularity than that enjoyed by any other class of plants. It is questionable, however, whether their popularity, at least in their present form, will continue, and no one would be surprised if the overgrown specimens, which are now so much admired in flower-shows and florists' shops, do not give way to more artistic and less expensive flowers.

Notes.

An interesting variety of the common Elder is described in *Meehan's Monthly*. It is simply a sport from *Sambucus Canadensis*, in which the berries, instead of being deep wine color or almost black, as usual, are white.

Dr. Chapman's herbarium of southern plants, upon which is based his *Flora of the Southern States*, has been purchased by Mr. George W. Vanderbilt, and will serve as a nucleus of the scientific collections which he is establishing on his estate at Biltmore, in North Carolina, in connection with an arboretum and systematically managed forest.

Saintpaulia ionantha, referred to in a previous number of this journal, was awarded a first-class certificate during the recent exhibition in Orange, arranged by the New Jersey Floricultural Society. It is now very floriferous, and will, no doubt, become very popular. For the last two months it has flowered without interruption and is still improving; new buds and flowers constantly take the place of the old ones. The flowers vary from a pale lavender to a very deep purplish blue.

The young Dutchess County Horticultural Society held its first Chrysanthemum show at Poughkeepsie last week, and it was exceptionally good. The competition for cut flowers in lots of twelve and twenty-four, both on their stems and on boards, brought out as fine a display of good flowers as is ever seen in the larger city exhibitions. James Blair, gardener to Ogden Mills, Esq.; W. Gomersall, gardener to Winthrop Sargent, Esq.; Thomas Harrison, gardener to Governor Morton, and J. H. Powell, gardener to Samuel Thorne, Esq., took the leading prizes. The special competition for twelve blooms of Golden Wedding brought out another remarkable lot of flowers. There was a display of Orchids by C. Dumper, gardener to F. Newbold, Esq., and an abundance of well-grown Roses from many of the large private places in the vicinity. Poughkeepsie is noted for its production of Violets, and the prize which was offered for the best hundred flowers of Marie Louise was won, after close competition, by J. Sloan & Sons. The society's prize for violets was taken by C. W. Bahret.

During the warm damp days of last week the supply of field mushrooms was so abundant that they could be bought for as

little as forty cents a pound even in the fancy-fruit stores. During much of the year mushrooms command prices that are prohibitive to many housekeepers, and this warm autumn weather makes what is usually a luxury available for every table. Summer squashes from the south cost seven cents each. The season for Kalamazoo celery will be ended in another fortnight. The Michigan crop is always cleared up during early winter, since the boggy soil freezes early. Later on supplies will come from Rochester, in this state, where the warmer soil makes late banking up possible. Hot-house tomatoes are coming from Pennsylvania, Massachusetts and Long Island, and sell for fifty cents a pound. Hot-house radishes bring ten cents for three bunches. Artichokes from France cost twenty-five cents each, and Brussels sprouts from the same country twenty cents a pound; the heads of this imported vegetable are more solid than those from near-by farms, the best of which cost eighteen cents a quart.

The showiest apples now noticed in the retail stores are deep red Wine-saps, the brighter-colored Spitzbergs and striped Gravensteins; Lady apples cost twenty cents a quart. Richly colored, smooth quinces from California are offered at reasonable prices, and persimmons from that state can be bought for thirty cents a dozen. Grapes from California are still plentiful, of the largest size and rich coloring. Flame Tokays, Red Emperors, Black Cornichons, White Malagas and the more recently arrived Verdels make a striking show in the wholesale warehouses set out in large numbers of double boxes. The Verdel grapes come in short heavily shouldered bunches, the berries slightly oblong, yellowish green, covered with bloom, and these are as showy in a way as the more brilliantly colored grapes. Hot-house grapes are arriving from Liverpool twice a week. This fruit has been unusually handsome, and the importers have quickly sold out to retail dealers at \$1.50 to \$2.00 a pound. Sugar-loaf pineapples from Havana cost fifteen cents each. Tangerines from Jamaica now bring fifty cents a dozen, oranges thirty-five cents, and grape-fruit fifteen cents each. Jamaica oranges brought comparatively low prices recently owing to poor quality, \$3.00 a barrel being the average last week. Receipts of oranges from the West Indies thus far this season are said to amount to 60,000 barrels and 18,000 boxes. The shipments during the corresponding term last year were merely nominal, owing to the large Florida crop. This year that state will produce but 100,000 boxes, against 5,000,000 last season, and hardly any of this fruit will be sent north, since the Florida hotels can use all of it.

Mr. J. H. Hale writes to *The Rural New-Yorker* of an interesting experiment now in progress at Meriden, Connecticut, where Mr. Andrew J. Coe has been grafting different varieties of the Japan Chestnut on American stock. To satisfy himself of the hardiness of these exotic Chestnuts he grafted several of them four years ago on native seedlings in low ground, where the frosts of early autumn and winter are the most dangerous. Grafts put into three-inch stock eight feet from the ground have now formed a strong bushy head ten feet across, which bore freely this season, in spite of a severe winter, when Snyder Blackberries, the most hardy variety that is grown in New England, were killed to the ground. Mr. Coe has bought the best of Mr. Luther Burbank's Japanese seedlings, and on the wooded hillsides above the city of Meriden he has grafted an eighteen-acre block of native Chestnut sprouts with these improved varieties. Grafts were set both by the cleft and the crown methods, mostly on stocks two inches in diameter and four feet from the ground. Part of the work last spring was completed by the middle of April just as the sprouts were beginning to start, and the remainder was done later in May, when the leaves were well developed. Not more than one out of four of the early-set cions grew, but seventy-five per cent. of the later grafts have lived, although they are not growing as strongly as the few of the earlier ones which survived. The nuts of one variety called the Early, while not so sweet as the Burbank nuts, are beautiful in appearance and quite as rich as the average of American chestnuts, and since they mature fully three weeks earlier than our native nuts, they will probably prove of great value for the market. The nuts are of medium size, and so early that they are all gone before the American, the Spanish or the average Japan chestnuts ripen. The tree yields a large crop, which ripens all at once. Mr. Coe planted a nut of another variety received from Mr. Burbank which came into fruiting eighteen months after the seed was planted. The seedling is a profuse bearer of large fine-looking nuts and of better quality than any of the European nuts or their crosses. It is later than the earliest variety, but earlier than our native Chestnuts.

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLES —Seasonable Work Among the Trees.....	461
Autumn Colors of Leaves.....	462
The New York Cut Flower Company.—II.....	M. B. C. 462
A New Hybrid Oak in the Indian Territory.....	B. F. Bush. 463
The Names of some North American Tree Willows.....	C. S. S. 463
PLANT NOTES	464
NEW OR LITTLE-KNOWN PLANTS :— <i>Chrysanthemum</i> , William Simpson. (With figure.).....	464
CULTURAL DEPARTMENT :—A Few Hardy Plants.....	Robert Cameron. 464
Chrysanthemums at Cornell University.....	Wilhelm Miller. 466
Notes on Palms.....	N. J. Rose. 466
A Few Novelties.....	E. O. Orpet. 467
<i>Oncidium varicosum</i> Rogersii.....	J. N. G. 467
CORRESPONDENCE :—Is Young Timber Weaker than Old?.....	B. E. Fernow. 467
Ornamental Shrubs for Nebraska.....	Professor Fred W. Card. 468
EXHIBITIONS :—Autumn Flower Show in Chicago.....	E. J. H. 468
American Institute Chrysanthemum Show.....	469
NOTES	470
ILLUSTRATION :— <i>Chrysanthemum</i> , William Simpson, Fig. 64.....	465

Seasonable Work Among the Trees.

IT is not safe, as a rule, to plant trees as far north as the latitude of New York after this date. When young trees are planted in early autumn while the ground is warm they will be encouraged to throw out new roots to furnish them with the needed supply of moisture through winter. If the ground is firmly settled they may not be heaved by the frost; if they are properly staked and tied their roots will not be loosened as the tree is swayed by winter winds, and they will be ready to start into vigorous growth in the spring. After this time, however, when the ground is cold, fresh rootlets are slow to start, and a newly planted tree is in danger. But, although it is too late for the safest planting, this is just the time of year to study planting plans and to decide where each tree is to be set and what tree is to be set there. If nursery stock is now selected and ordered, trees received before the ground freezes hard can be heeled in carefully where no water can collect about the roots, or, still better, if such facilities are available, they can be wintered in a cold pit or cellar. Where the ground has not already been prepared for the trees, large holes should be dug at once and filled in with good soil, and this will settle compactly in the winter and be in much better condition for planting than if it were loose and open after being freshly dug. After the position of each tree has been decided upon and the ground prepared beforehand, the mere planting is a comparatively short and easy operation, and everything that is done now in the way of preparation will help to relieve the pressure of work in the spring. This is a great advantage in our northern states, where only a few days of good weather intervene between winter and summer—days which are always crowded with work of every sort.

But, beyond preparing for next spring's planting, these autumn days are the best of the year to study plantations already made, with a view to determine which trees shall be removed and how the remainder shall be pruned. It is easy now, just after the leaves have fallen, to observe how the individual trees of a group are affecting one another. When real winter weather comes it is much more difficult to make a sufficiently careful examination and to decide which ones should be cut down because they are interfering

with their neighbors, and to see where there are any limbs of those which remain that ought to be shortened. It is a good time, too, to inspect young trees and prune them so that they can be kept properly shaped and balanced. There is an unfortunate prejudice against pruning trees as an unnatural process, but this conservative surgery, which is only meant to force the young trees into taking their normal form, is quite different from what is called "clipping them into shape," as is sometimes practiced with conifers and is almost always to be deprecated.

The thinning out of plantations, however, and not the pruning of trees, is the work requiring the most intelligence and determination. Many people have such a sentimental or superstitious feeling toward trees that they will allow them to stand even where not only their own health and symmetry are sacrificed, but where they imperil the health and symmetry of much more important trees. Light, air and space for development are absolute essentials if we are to have fine specimens. In a forest we take care to have the trees stand so closely that they will be forced up into long straight stems, for only such will make valuable timber; but for ornamental trees the requirements are entirely different. Not one of a group of trees when too closely massed can become a fine specimen which will live to a vigorous old age. Of course, no hard-and-fast rule for thinning can be made which will cover all cases, for the varied wants of each different species must be provided for. A Fir, or a Spruce, with its lower branches lost is an unsightly object, but in a group of White Pines the naked trunks have a nobility of their own. Some of our Oaks, especially the White Oak, make a beautiful mass, and no inconsiderable portion of this beauty is found in the tall, sturdy, bare trunks of the trees with their ash-colored bark, while the same tree as a single specimen is much more impressive when it has low, wide-spreading, horizontal branches. It requires as much judgment, therefore, to cut a tree as to plant one, and it can only be properly done by a person who is well acquainted with the characteristics of each species and has a clear idea of the ultimate effect which he aims at. This is the best time of the year for a critical examination of trees and for deciding which ones are to remain and which ones ought to be felled, and just as soon as the time comes for removing one there should be no delay. In a few years the damage will be beyond repair, for after a tree has been forced out of shape by its intruding neighbors it will remain unshapely ever after.

Fortunately, there are obvious cases in which no remarkable knowledge or judgment is necessary. Wherever a good tree is cramped or marred by an inferior one, or wherever a tree which will become a noble one if it only has the chance is hindered from attaining its best estate by another of less value, there should be no hesitation or unwillingness to use the axe. Very often the superintendents of public parks who do their duty in this respect are assailed with popular clamor by short-sighted people who are horrified to see the destruction of anything like a tree. This outcry is often so serious that to escape it officers who know better leave the trees in park-plantations to crowd and starve each other until they become objects of commiseration; whereas, if they had been thinned in time with serious purpose, the remaining ones would continue to be objects of the highest civic pride for generations to come.

All this is but the simplest elementary teaching. It is what has been said over and over again year after year, and yet we fear it will need to be repeated for years to come before people are educated up to the point where they will look at a badly placed tree as a weed which ought to be exterminated as pitilessly as any other weed. There is not one of the older parks in this country which does not show examples of stunted and half-dead trees which, with proper care, might have been full of sap and vigor and endowed with the power to gain fresh beauty and increased dignity for centuries. There are few proprietors of large places who cannot now make a personal inspection of

their trees to advantage, and few such estates where the axe ought not to be wielded with promptness and vigor. We are quite sure that every one who fells a tree intelligently this autumn will feel assured a year hence that this work was quite as commendable as the intelligent planting of a tree.

THE effect of frost upon the leaves of trees and shrubs varies with different species. The leaves of some of our native trees which turn most brilliantly, like those of the Scarlet Maple and the Tupelo, mostly take on their autumn colors and fall before hard frost; and on many species of plants the leaves are killed outright or greatly disfigured by the first real freeze; on others they retain their beauty after many nights of real freezing. The leaves of the Japanese Maples, which assume late in the season very brilliant shades of scarlet, are susceptible to frost, and in some parts of the country were killed this year before they had time to change. *Parrotia Persica*, a small shrubby tree of western Asia, of the family of our Witch Hazel, bears leaves which frost does not seem to affect, and in the middle of November are now bright orange color, and just beginning to turn scarlet. This late appearance of such brilliant color reminds us how long the period is over which this distinctive beauty of the autumn season in America extends. It was two months ago when we began to make notes of the bright scarlet which even then had begun to kindle in the foliage of the Tupelo, and every week since then we have tried to characterize as well as we might the colors of different shrubs and trees as their leaves were turning. In the Plant Notes for this week two or three other shrubs and trees are mentioned for their special value at this season, and in future numbers of the paper we shall invite attention to additional examples of this character.

The splendors of our woods in autumn are often celebrated, but almost invariably the glory is characterized as transitory. While it is true that in large masses of woods there is a climax when for a few days a great number of trees come to their brightest all at once and then seem to burn out suddenly; nevertheless, if we note individual trees and the effects of changing leaves not only on woody plants, but on the very herbage of the fields, there are fully two months during which this singular beauty of ripening foliage appeals to us on every side. It is well, therefore, to remember that the autumnal beauty of our landscapes is not a fleeting transformation scene, but a great panorama in which splendor follows splendor in long procession.

The New York Cut Flower Company.—II.

GRÖWERS who aim to get the best flowers to market in the best condition place their stems in water as soon as they are cut. They are kept in a cool dark underground room, subcellars being used in many establishments which make a specialty of growing for market. Thus filled with water they will stand up longer and not wilt so quickly from loss of moisture by evaporation. This method of cooling is considered better than using ice, as the flowers keep better when not subjected to violent change of temperature from a refrigerator to an express car. They are usually cut when the temperature of the houses is not extremely high, morning being preferred to evening, since such flowers as roses are softer after hours of exposure to bright sunlight, and ripen during the night. In summer as little time as possible is lost in getting the flowers into market, while in cooler weather some are improved if kept twelve to twenty-four hours before being packed for shipment. Long shallow wooden boxes are smoothly lined with newspaper, above which sheets of thin oil-paper are laid. The heads are usually placed at each end of the box, and in the case of very large chrysanthemums there are but one or two rows of blossoms, the stems being tied to the bottom of the box with raffia to hold them in place. Roses are carefully laid in successive rows, an

equal number at each end, and smaller stock, as mignonette and lily-of-the-valley, in one direction, in even beds of bloom. The boxes are carefully strapped and sent by express. The companies allow special net rates and return the empty boxes without charge. At such stations as Madison, New Jersey, where floriculture is largely carried on, an extra car is provided specially for cut flowers.

Upon arrival at the railroad station in New York the boxes are quickly transferred to wagons and driven to the Twenty-fourth Street entrance of the Cut Flower Company, where they are lifted to the receiving-room on an immense elevator. Here they are at once opened, examined by an expert and graded according to established rules. Roses, for example, are classed as fancy, extra, first, second and third. American Beauty and American Belle are the only varieties which enter into the fancy class, a requisite being stems twenty-four inches and over. In the class known as extra, stems sixteen to twenty-four inches are specified for the same varieties, and for other varieties eighteen inches and over. Stems ten to sixteen inches long are required for first-class flowers of these two larger sorts, six to ten inches for second class, and less than six inches for third. In the same classes for all other roses the conditions for stems are twelve to eighteen inches, seven to twelve inches and less than seven inches. From these general classifications for roses other than American Beauty and American Belle, there are special rules for particular varieties. The smaller-growing sorts, as Niphos, Papa Gontier and Souvenir de Woottton, for instance, have a standard for shorter stems than such roses as Belle Siebrecht and Perle des Jardins, while yet longer stems are required for Bride, etc. But length of stem is by no means all that is required. Roses to be classed in the higher grades, must have large, well-formed buds of good substance, clear bright color, and be free from blemish; the stems be straight and stiff, and the foliage luxuriant and clean. An off-color Meteor rose, good in all other respects, would go into class three. If some specially fine flowers are received, which plainly rank above the regular classes, special prices are readily paid for them by dealers who are always ready to take choice stock. The best flowers always sell quickly, and there is never a surplus. Glut and consequent loss always occur in the lower grades.

Prices are revised at the beginning of each week, and changed when necessary, but this has only occurred four times since September 1st. After the grading is done a slip with the quantity and quality noted is placed to the credit of the shipper, and the stock is placed in a refrigerator kept at forty-five degrees, or at once exposed for sale in the large adjoining room. There are always standing orders from retail dealers, even in advance of their personal visits, for stock from day to day. One large table is used solely for the filling of advance orders. It is laid off in sections assigned to the best regular buyers, the spaces designated by a permanent card bearing the buyer's name, and stone jars hold the stock until the buyer comes for it. Not until after the regular store trade is supplied are sales made to the street venders. Some of these are Americans, not a few of them women of ability and character. The majority are, however, Greeks, shrewd buyers, and sellers, too, and good manipulators, as an observing grower declared. These Greeks are born merchants, many of them men of wealth. Although they have occasional sharp rivalries which are sufficiently bitter to suggest the possible use of the stiletto, they shrewdly combine to get the good out of any exceptional market condition. They are scattered all over the city and rent many spaces inside the sidewalk line on busy thoroughfares, besides stands in other public places.

Special demands are made for notable weddings and for festal days, as Christmas and Easter. Last week one order embraced 4,000 carnations, 14,000 chrysanthemums, 10,000 roses, 400 strings of smilax and as many more of asparagus, 4,500 sprays of lily-of-the-valley, 2,000 Bermuda lilies and 100 cattleyas, and half as many again were bought

from other sources for use on the same occasion. Of course, this was apart from the forest of Palms and other decorative plants in pots. In preparation for supplying unusually large quantities at one time the development of some flowers is retarded in the hot-houses, and that of others is hurried forward.

The loss on unsold flowers is equitably divided pro rata among consignors in the class in which it occurs. Quality is in no small degree determined by weather, soft and mussy stock coming in after muggy days. General high quality of the great masses of flowers seen here is remarkable, as is also their freshness. A much higher grade is demanded now by retail buyers than a half dozen years ago, and flowers sold on the streets are especially of better quality during the past three or four years. The choicest varieties and newest sorts are offered here, and fragrant blossoms are always in special request.

The first buyers come as early as seven o'clock in the morning. Flowers looking dewy and fresh have already been taken from the largest refrigerators used for this sort of storage in the country and displayed in the salesroom, and others continue to arrive. Of carnations, from 5,000 to 25,000 are handled in one day, as many more violets and lily-of-the-valley, and 40,000 roses. At six o'clock in the evening the receiving and selling is over, and the storing of the freshest flowers still unsold concludes the work of the day. It is pleasant to record the fact that any flowers left over are presented to the hospitals.

New York.

M. B. C.

A New Hybrid Oak in the Indian Territory.

WHILE collecting along a little rocky branch a mile south-west of Sapulpa, Indian Territory, on September 20th, I was led to observe more closely the Texas Red Oak, *Quercus Texana*, on account of its occurrence in such large numbers, and while doing this I came upon an Oak plainly different from that species, and which I thought to be a hybrid. After a careful study of it and the surrounding trees, I became satisfied that it was a hybrid between the Black Jack Oak and the Black Oak. It may be briefly described as *Q. Marilandica* × *velutina*, n. hyb.: a tall, slender tree, scarcely resembling either *Q. Marilandica* or *Q. velutina* in general appearance, but more like the latter; trunk and branches exactly like those of *Q. Marilandica*, but twigs and branchlets like those of *Q. velutina*; buds nearly like those of *Q. velutina*, but larger; leaves broader at the upper end and tapering to a narrow, sometimes cordate base, three to five lobed; lobing very various, some like *Q. Marilandica* and some like *Q. velutina*, all shortly bristle tipped; upper surface of leaves as in *Q. Marilandica*, but lower surface nearly like that in *Q. velutina*, but somewhat rusty-downy; petioles slender, nearly smooth and averaging about one inch in length; acorns long and slender-pointed, very rusty-downy when young, but nearly smooth when mature, striped with alternating lines of black and yellow, as in *Q. Marilandica*; cup top-shaped, with a scaly edge, longer than that of either *Q. Marilandica* or *Q. velutina*, but approaching the latter more nearly. One tree only, sixty feet in height, with a trunk about fifteen inches in diameter, and growing in a rocky hollow where *Q. Texana* is abundant, and *Q. Marilandica*, *Q. minor* and *Q. velutina* are common.

B. F. Bush.

The Names of some North American Tree Willows.

SALIX LONGIFOLIA, Muehlenberg (*Neue Schrift. Gesell Nat. Fr.*, Berlin, iv., 238, t. 6, f. 6), was published in 1803. In 1778 Lamarch had published in his *Fl. Franç.* (ii., 232) a *Salix longifolia* to which he referred the *Salix viminalis* of Linnæus, and the next oldest name of Muehlenberg's plant, *Salix fluvialis* of Nuttall (*Sylva*, i., 73), published in 1842, must be adopted.

Salix rostrata, Richardson (*Arctic Exped.*, 753), was published in 1823. In 1799 Thuillier had published in the second

edition of his *Flore des Environs de Paris* a *Salix rostrata* now referred to *Salix repens* of Linnæus. Asa Gray in 1867 (*Man.*, ed. 5, 564) called the Beaked Willow *Salix livida*, var. *occidentalis*. The name *occidentalis* had been used for a West Indian species by Koch in 1828, and four other varietal names, *latifolia*, *lanata*, *obovata* and *lanceolata*, given to it by Andersson, had all been previously employed in this genus. This common, familiar and widely distributed tree being, therefore, deprived by the rules established by American botanists of any name at all, I am glad to associate with it that of Mr. S. B. Bebb, of Illinois, the learned, industrious and distinguished salicologist of the United States, to whom, more than to any one else of this generation, we owe our knowledge of American Willows, and to call it *Salix Bebbiana*.

Salix flavescentia, Nuttall (*Sylva*, i., 65), was published in 1842. In 1828 Host published in his *Salix* (31, t. 101) a *Salix flavescentia* now referred to *Salix Arbuscula*, Linnæus, and this name being thus unavailable for the Rocky Mountain tree, I propose to call it *Salix Nuttallii* in honor of Thomas Nuttall, who discovered and first described it. The variety *Salix flavescentia*, var. *capreoides*, Bebb (GARDEN AND FOREST, viii., 373), thus becomes *Salix Nuttallii*, var. *capreoides*.

A large-leaved form of *Salix lasiandra* discovered by Dr. David Lyall in 1859 on the lower Fraser River was first described by Andersson (*Sal. Monog.*, 34, f. 23) as *Salix lancifolia*, and in 1868 (De Candolle, *Prodr.*, xvi., pt. ii., 205) as *Salix lucida*, β *macrophylla*. This specific and varietal name having been previously used in *Salix*, I propose for this variety the name of its discoverer, and call it *Salix lasiandra*, var. *Lyallii*.

C. S. S.

Plant Notes.

CRATAEGUS APIIFOLIA.—This is a small tree, with delicate, nearly circular, deeply cleft and divided leaves, of the southern states, where it is mostly confined to the coast region, although west of the Mississippi River it ranges inland to central Arkansas. Plants raised from seed gathered near Little Rock, Arkansas, have produced plants which have proved fairly hardy in the Arnold Arboretum, although they have not flowered there yet. The Parsley Haw, as *Crataegus apiifolia* is often called, is one of the most delicate and beautiful species of the whole genus, and in the Arboretum this autumn it has been specially noticeable for the brilliant deep red color assumed by some of the leaves, while others on the same branch remain unchanged in color. Quite uninjured by frost, the leaves were in their greatest beauty last week.

ROSA SETIGERA.—The beautiful Prairie Rose should receive another word of praise for the colors it takes on late in the autumn, when the long arching stems turn dark purple and are coated with a glaucous bloom, and the leaves are brilliant orange and scarlet. It is one of the most valuable of all shrubs, and many people think the most beautiful Rose. Its merit as an ornamental plant has often been pointed out in these columns, but we venture to remind our readers of its hardiness and vigor, the rapidness of its growth, its graceful habit, and its many clusters of large pure pink flowers, which open later than those of most single-flowered Roses. The Prairie Rose has been largely used with good effect in some of the Boston parks, in which it flowered freely this year, and its beauty was a revelation to the public. This, perhaps, will lead to a more general use of this delightful plant.

LEUCOTHOË RACEMOSA.—The most brilliant plant we know, however, in the middle of November in the northern states, is *Leucothoë racemosa*, a common shrub in moist thickets in the neighborhood of the Atlantic and Gulf coasts of North America, from Massachusetts southward. This is just now the most conspicuous shrub in the Arnold Arboretum, in Boston, where it has been planted in large numbers, and an object of great beauty, with flaming scarlet leaves which

hard frost has not disfigured. *L. racemosa* sometimes grows to the height of ten feet, with rather stout erect stems, oblong acute leaves and erect racemes of small Heath-like flowers. In cultivation it enjoys rich, rather moist soil and grows rapidly into a broad bush. Few plants surpass in brilliancy of autumn color this familiar inhabitant of our swamp-borders, or bear leaves that are so resistant to cold; it is easy to raise and to cultivate, and it is a plant we should suppose that every one who desires to enjoy a garden in November here would want in large numbers. But in how many nurseries in this country can this shrub and scores of other desirable native plants be found? Many people would be glad to use such plants if they could buy them, but improvement in the character of nursery stock obtainable in this country does not proceed rapidly, although it is now possible to buy many more native trees and shrubs than it was ten years ago, and in American parks American plants are beginning to replace the foreign species which before that time were the planters' only resource.

HYMENOCALLIS CARIBAEUM.—This exquisite plant is often met with in gardens under the name of *Pancratium Caribaeum*. It is a remarkably beautiful species, native of the West Indian Islands and southern Florida. In some respects it resembles *Hymenocallis speciosum*, but the flowers are very much larger, measuring over eight inches across. The tube of the flower is very slender, four or five inches long; segments equally long, linear-lanceolate, half an inch or less wide, spreading. Between the long thread-like stamens there is a large cup-shaped corona of membranous texture. The scape is about eighteen inches high, stout, erect, supporting an umbel of from eight to twelve flowers. Bracts large, ovate-oblong, greenish white. Leaves about two feet long, three to four inches wide, oblique, lanceolate, of a deep shining green. The bulbs should be buried below the surface of the soil. Rich fibrous loam is the best. A good drainage is necessary. The plant sometimes flowers several times in a season, and the snowy-white flowers are very fragrant.

PTERIS CRETICA OWRARDII.—This is a large and robust variety of an old well-known Fern. It differs little from the type, except in its more solid texture and larger growth, and in its clean-cut, well-developed foliage. While *Pteris Cretica* frequently becomes disfigured by black transverse spots in the leaves during moist and dull weather or through cold and overwatering, the variety is more able to resist decay through its more solid texture. It is, therefore, more valuable for all purposes, and will probably in time replace the species as a commercial decorative plant. It can be raised from spores as easily as the old kind and will do well under the same conditions—that is, a temperature of about sixty degrees, in rich, fibrous soil and a light position. As a house plant nothing can be more graceful and ornamental, and for this purpose it should be grown in small vases or ornamental pots. With moderate care it will do well in a not too dry or overheated atmosphere.

ONCIDIUM FORBESII.—Although Orchids are becoming popular and common in the eastern states, this beautiful species is rarely seen. It is one of the finest of a large and interesting genus and nearly related to *Oncidium crispum*, which, however, is less showy. The flowers measure about two inches across in well-grown plants. The petals have wavy, bright yellow edges, the rest being of a rich, reddish-chestnut color. They are produced in few-flowered nodding racemes on rather long peduncles from the base of the flat-furrowed pseudo-bulbs. The leaves are long, lanceolate, of a leathery texture and dark green color. This is a Brazilian mountain species, and should be grown in moderate heat in a Cattleya-house. It thrives best in a light and partially sunny position, and, like most *Oncidiums*, it requires a thorough rest in winter and plenty of moisture during the growing season. It blooms during October or November, and the flowers remain beautiful for a considerable time. Blocks of wood or small baskets are most suitable for this species.

New or Little-known Plants.

Chrysanthemum, William Simpson.

THIS new variety has been exhibited nowhere except at the recent Philadelphia flower show, where it took the silver medal for the best American seedling *Chrysanthemum* not yet disseminated, besides a certificate of merit and the first premium for six blooms of the best pink seedling. On a scale of one hundred points when it was judged by the *Chrysanthemum Society of America*, the committee, consisting of such careful judges as Edwin Lonsdale, Robert Craig and William K. Harris, gave it eighty-six points out of a possible hundred and reported that in their estimation it was a great acquisition among early pink sorts. It belongs to the Japanese incurved type, with the centre entirely hidden, but there are several of the lower rows of petals somewhat reflexed, a character not plainly seen in the specimen figured on page 465. It is more like Mrs. E. G. Hill than any other variety, though it is a much deeper flower. In color it is a pleasing shade of pink, rather brighter than that of Maud Dean. The flowers are very durable, those that were judged on the fifth of November in Philadelphia having been cut on the 26th of October and kept in a cool cellar. The plant is a strong and healthy one, growing from four to five feet high. The flowers this year were all grown on terminal buds, but the best judges think that they would be improved by growing them from lateral buds. The strong points in favor of this flower are its earliness and its size. This year all *Chrysanthemums* were late, but last year this variety was fit to cut on the 15th of October. Some of the flowers judged by the committee of the *Chrysanthemum Society* measured more than ten inches across, and one of them was eleven inches in diameter. The plant was raised by Mr. Joseph Heacock, of Wyncote, Pennsylvania, from seed gathered in the autumn of 1893 from his own plants, but no record of its parentage was kept.

Cultural Department.

A Few Hardy Plants.

THE Clematises belonging to the group with tubular flowers are interesting and distinct, although some of them are not very showy. The summer-flowering kinds, such as *Clematis tubulosa* and *C. Davidiana*, are pretty well known in gardens, but there are one or two autumn-flowering sorts which are seldom seen. *C. Lavallei*, a plant belonging to this group, which comes from China, attracted a good deal of attention here when in bloom this fall. It is a showy plant and has very sweet-scented flowers. It attains a height of four or five feet, and its stout grooved stems are thickly covered with broad trifoliate leaves. The leaflets are roundish, ovate, and are deeply toothed or somewhat lobed. The tubular whitish flowers are produced abundantly in large loose leafless panicles, which stand well above the foliage of the plant. The flowers begin to open about the first week in September and last in good condition for several weeks. A deep rich soil and a partially shaded position suits the plants well, and under those conditions they grow vigorously. The largest stems are slightly woody at the base, but they are cut down every winter even with the ground, and the flowers are produced on the young stems. In the border the plants require to be tied up loosely to a stout stake; but if they are in a position where they have plenty of room, the stems may be left loosely on the ground, where the panicles make a pleasing effect.

Another good *Clematis* belonging to this same group is a plant which is found in gardens under the name of *C. Stans*. Although the plant has the habit of *C. Stans*, yet it looks very different from the plant which is figured in *The Botanical Magazine* under that name. It compares very favorably with specimens of *C. Savatieri*, Dene., which are in the Gray Herbarium, another Chinese plant. This plant grows from two to three feet high and has trifoliate leaves, and the whitish tubular flowers are in terminal panicles. It has a good habit and makes an excellent border plant, coming to flower a week later than *C. Lavallei*. An open position and a good deep rich soil are its requirements. Both of the above plants are quite



Fig. 64.—Chrysanthemum, William Simpson.—See page 464.

hardy here, standing our most severe winters without any protection.

There are very few plants in the garden that blossom for such a length of time as *Phlox maculata*. The plants here began to bloom early in July, and they are still producing flowers up till this date, November 12th. It is strange that so pleasing a plant is so rarely cultivated now in gardens. Indeed,

there are very few of the improved varieties of this species or of *P. paniculata* that are as pleasing and effective as this typical plant. This *Phlox* grows about two feet high, and the stems are slightly spotted with purple. The leaves are smooth, the lower ones lanceolate and the upper ones nearly ovate-lanceolate from a cordate base. The flowers are of a pink-purplish color and are produced in long narrow panicles. The plants

do best in a cool, slightly shaded position and moderately rich soil. This plant is found in rich woodlands and along streams from northern Pennsylvania to Iowa and Florida.

Botanic Garden, Harvard University.

Robert Cameron.

[*Phlox maculata* is easily established and often escapes from cultivation. See also GARDEN AND FOREST, vol. v., p. 156.—ED.]

Chrysanthemums at Cornell University.

THE test of new varieties of Chrysanthemums now progressing at the forcing-houses under the direction of Professor Bailey, seems to show that the new varieties of 1895 are, on the whole, not equal to those of 1894. The most conspicuous exception is the pure white Mrs. Henry Robinson (Pitcher & Manda), which is so much better than all the rest that it deserves the highest mention. It is early, very large and full, and very striking in general effect. It is the unmistakable hit of the season among the many visitors. Of the many other pure white varieties, *Crystallina* (Vaughan) should be singled out for its individuality. It is of medium size, but very distinct in shape and color, and agreeably suggests some old-fashioned Poppies.

Of the pink sorts, the much discussed Mrs. M. R. Parker, Jr. (Spaulding), is an early dwarf variety, which, unfortunately, shows too much centre to become popular, unless florists cut the blossoms before the centre becomes visible. The florets are quite tubular, and the plant is a distinct gain in uniformity of color in its class, although it cannot compare with Mrs. E. G. Hill for size of blossom or delicacy of shade. With the exception of Mrs. Higginbotham (Spaulding), an enormous hairy Japanese, with wide incurving and cupping florets, the new pink kinds are all disappointing.

Among the many yellow-flowered sorts there are no types sufficiently distinct to be classed among what are called sensational plants, though there are some welcome additions to well-known types of this highly specialized division. Of the pure yellow kinds, Mrs. W. H. Rand (Vaughan) is, perhaps, the best. The head is wide, flat and sprawling; the florets narrow, quilled and irregularly twisted. The prize-winning *Philadelphia* (Graham), which has done well in England, is an addition to the type of lemon-colored, globular-shaped, blossoms in which the florets are wide and incurving. One of our two specimens is doing poorly. Other successful pure yellows are Miss M. M. Johnson (E. G. Hill & Co.), an early dwarf, deep in color, like that of W. H. Lincoln; florets wide, but not coarse; Dr. Callendreau, tall, and of that creamy color that one associates with a successful "candy-pull." The stem is forty-eight inches high. That of Miss Georgiana Pitcher (Pitcher & Manda) is forty inches, although advertised as a dwarf variety. These two are similar in size and form, both having wide and gracefully incurving florets, but the latter has a deep rich color. The mixtures of yellow and rose are all unsuccessful. The new bronzes are also disappointing. There are slight gains, but no marked improvements, in the dark red or cardinal colors, of which G. W. Childs and Cullingfordii are well-known examples.

The season is characterized by a large proportion of freaks and oddities. Of this class the English importation, Rider Haggard, a pink Anemone with a stem sixty-two inches high and a flower nine inches across, is the most striking example. Less conspicuous, but even more eccentric, is the French novelty, Monsieur Georges Biron (Calvat). Our single specimen is strangely whorled to the left, counter clockwise, reminding one in its general effect of Vedder's illustrations of Omar Khayam. The tightly whorled portion shows the reverse side of the florets, of an anomalous old-gold hue, which contrasts curiously with the maroon of the lower florets. These lower florets radiate from the lower surface of the flattened sphere, as if shot out tangentially into space by a revolving body. The sense of motion is very strong. Equally noticeable is the indescribable color of Miss Helyett, a unique effort, which has at any rate the qualities of intensity and uniformity of color. Few will pass it by without comment, and everybody may be expected to take sides. W. W. Astor attracts comment from its singularity. It has many merits, and is a valuable contribution to the somewhat neglected Anemone-flowered type. Sunrise (May) is boldly and happily named. Among the many absurd names of Chrysanthemums this is a refreshing effort of imagination. It is a towering plant and striking flower, and emerges into even greater prominence under the white electric light. It is too early yet to formulate the results of the electric light upon the growing of this year's Chrysanthemums.

Ithaca, N. Y.

Wilhelm Miller.

Notes on Palms.

Phoenix Roebelenii.—This rare and beautiful Palm (see GARDEN AND FOREST, vol. iii., p. 273) is the smallest known species of the genus, with very fine and graceful foliage almost as narrow as that of *Cocos Weddelliana*, but more graceful. The long, spreading leaves are soft in texture and absolutely free from spines. The pinnae measure about six inches in length, and are linear-lanceolate in outline, of a bright shining green color, and slightly puberulent. The stem is only two or three inches in diameter, very rough, seldom straight. The habit is bushy; side shoots form freely at the base of the stem, making wide-spreading plants, generally more broad than high. This handsome Palm will probably remain very rare as long as no seeds can be obtained. At present the only possible way of propagation is by means of division, which will never give a large supply of salable plants. If seeds could be had this Palm would undoubtedly become very popular, as it is easier of culture than *Cocos Weddelliana*, and of an altogether different habit. It keeps free from insects and thrives well in moderate heat.

Bactris major.—Nature has rarely provided a more formidable protection for any plant than the exceedingly fine and sharp spines that cover the leaf-stalks and stems of some of our most beautiful Palms. This species is one of this kind, a graceful and beautiful Palm, with irregularly pinnate leaves, from three to six feet in length, with linear-lanceolate pinnae, of which those at the apex of the leaf are the broadest and largest. The rhachis is slender, with long black nudel-shaped spines, which cover the plant from the base of the stem to the end of the midribs. This Palm is one of the semi-scandent kinds and will thrive well in a soil composed of equal parts of fibrous loam, leaf-mold, decayed manure and sand. It requires considerable heat and moisture for rapid development and should be kept in the warmest available place. Side-shoots are produced freely, and this is the only means of propagation in a greenhouse, as seeds cannot be easily obtained.

Geonoma acaulis.—This pretty dwarf Palm is very sturdy and compact in habit, forming suckers from the base of the short fleshy stems, making large masses of handsome foliage. The leaves are of the pinnate type, but they are hardly ever divided except at the apex, where the blade is split open down to the end of the midrib. The petiole is considerably shorter than the blade, which is almost horizontally spreading and of a yellowish green color and faintly tinted red when young. The stem throws out fleshy roots below the leaves and numerous side-shoots by which the plant is propagated. The Geonomas are tropical woodland plants, growing in deep shade in loose and rich vegetable soil. Under cultivation they thrive in a compost of equal parts rich fibrous loam, leaf-mold and sand. A shady position, moderate watering and about seventy degrees of heat is sufficient during the winter months.

Licuala grandis.—This is the most popular of the newer Palms, and it bids fair to supplant *Livistona Sinensis* itself to a certain degree. It undoubtedly possesses many good qualities as an ornamental plant—a neat habit, convenient size, pleasing form and color. In young specimens the leaves are almost orbicular and undivided, with exception of a few slight indentations at the edges. The petiole is slender, as long or longer than the blade. The color is a very fine dark green. Seeds for propagation are almost as easy to obtain as those of *Livistona* or *Areca*, and they germinate quite as freely. The only drawback to its general cultivation is the fact that it is very liable to the attack of thrips and red spider, especially while it is small. Frequent sprayings with well-diluted insecticides and a moist and warm atmosphere will, however, effectually prevent these pests from doing any serious injury. Large plants are less subject to them; a healthy condition and a rapid growth are the best safeguards against their attacks.

Martinezia caryotæfolia.—In general appearance this fine Palm somewhat resembles the Fish-tail Palm (*Caryota*). It is a very spiny plant with almost erect leaves from three to six feet in length, pinnate, with the pinnae disposed in clusters of two or three at irregular intervals. The rhachis is very slender, protected with long black spines. The leaves are sheathing at the base and very spiny; pinnae cuneate, eight to twelve inches long and about half as broad, præmorse; bright green above, grayish beneath, with an occasional spine here and there on the lower surface. This is a strong healthy species well worthy of culture. It is not subject to insects or diseases, but will do well with very moderate care. The soil should be rich and the pots must be carefully drained. It enjoys a half-shady position.

Newark, N. J.

N. J. Rose.

A Few Novelties.

Scabiosa Caucasica alba.—This is one of the most recent novelties sent us for trial, and it is a white counterpart of the type. It is white, too, without any shading of blue in the flower, but it is in no way an improvement on the original. The principal charm of the older plant is its rare shade of lavender-blue and its free-flowering propensity, but the white variety seems to lack vigor as well as color, and it is a question if it ever becomes popular.

Saintpaulia ionantha.—It is not often that we are privileged to try a genuine new plant that has so few characteristics in common with others in cultivation, and we are much pleased with this pretty little Gesneriad from South Africa. That it is new is evinced by the fact that a new genus had to be made for it, there being no other into which it would fit, and the name, contrary to expectations, seems as if it will stand the test of time; it is made to commemorate Monsieur de St. Paul Hillaire, who sent it from South Africa to his father, who later distributed it. Our plants were raised from seed sown early last year, and we obtained about fifty plants from a packet. The seeds are small, similar to those of the *Gloxinia*, and require the same treatment after sowing. We started to treat the plants similarly when growing, but soon found that they liked a cool house with shade from strong sunshine, and when they were moved into four-inch pots they began to bloom about July, and have continued to do so ever since without intermission. The foliage is at times almost hidden by the quantities of pretty violet-blue blossoms, and there are still no signs of their ceasing. There are no tubers to the *Saintpaulia*, though we rather expected there would be, on account of the close relationship of the plant to a tuber-bearing family like the Gesneriads. However, this plant will root readily from leaf-cuttings, and, after seed, this seems the most simple way to propagate it.

Spiraea Anthony Waterer.—A colored figure of this novelty was published in the London *Garden* for January, 1894, which showed what an acquisition the plant would be if only the color of the flowers were as good as the plate represented them. *Spiraea Anthony Waterer* is a sport from *S. bumalda*, which is itself a variety of *S. Japonica*, a dwarf-growing shrubby Japanese species, growing about two feet high and having flat or cymose heads of beautiful deep rose-colored flowers. As I saw these in August last at Mr. Waterer's nursery, where it originated, the color was certainly as good as the colored figure, and there can be no question that we shall soon see it as frequently in gardens as the hardy *Hydrangeas* when it is better known to planters. It is a sport, or bud variation, and was shown first in 1891 and received an award of merit under the name of *Beauty of Knap Hill*, but later, in 1893, under the above name, it received the additional honor of a first-class certificate from the highest horticultural tribunal in England, and if the color stands the hot sun here and keeps as bright as it does in the gardens of the introducer, it will be a valuable flowering shrub for July, August and September, for it has an extended flowering period. [*Spiraea Anthony Waterer* flowered this year for the first time in the United States. See page 315 of the current volume.—ED.]

Weigelia Eva Rathke.—This may be described as a perpetual-flowering *Weigelia*, producing clusters of bright cherry-red flowers with more or less profusion all through the summer. I saw it in August with quite a show of bloom, and shrubs that flower at that time are not common, but there was a reasonable promise of bloom for the rest of the summer, to judge from the unopened buds, and I was assured that it was as good as its raisers claimed in this respect.

South Lancaster, Mass.

E. O. Orpet.

Oncidium varicosum Rogersii.—When this fine plant can be had the ordinary type does not seem worth retaining. The flowers of Rogers' variety are quite two inches in diameter across the lip. They are of a beautiful deep golden-yellow, with brownish spots on the petals. With its long stem and broad spreading panicle of beautiful flowers it is one of the most charming of Orchids, and seems to thrive under ordinary greenhouse conditions, providing, of course, the atmosphere is kept fairly moist. My belief is that any Orchid which proves satisfactory in my greenhouse under my care is likely to do well with the average amateur, and I am, therefore, inclined to commend this one even to beginners. My experience with Orchids has been rather limited, but I am quite certain that the amateur will be likely to find much interest and probable success with any of the cool-house species, and he is quite likely to meet with success with even such things as *Cattleya citrina*

and *C. Dowiana* and others which have a reputation for miffiness. These have done better for me than *Lycaste Skinneri*, which has the reputation of flowering as readily as a Pelargonium. Uncertainty is very certain in the garden.

Elizabeth, N. J.

J. N. G.

Correspondence.

Is Young Timber Weaker than Old?

To the Editor of GARDEN AND FOREST:

Sir,—The very interesting account by Mr. Dana of the Pineum Schoberianum, in your issue for November 6th, naturally elicits admiration for a man who, with such singleness of purpose and with such perseverance, could devote his means and attention to experiments on such a large scale for obtaining information that does not bring pecuniary gain to the experimenter. Such action certainly suggests similar attempts to men of means in our country, especially as the instability and constant change in the administrative offices of our Government does not warrant undertakings of such a nature by the Government.

The object of these lines, however, is not so much to bestow praise and command imitation as to suggest that Mr. Schober is in error about the necessary delay in completing his inquiry regarding the species planted—namely, determining "their power of resistance, their durability and their relative value as fuel." It is stated, that "in order to arrive at this final solution of the problem it is his estimate that at least forty years more will be required."

The notion that young timber is inferior, as far as strength is concerned, to old timber, is one that has held sway so long that it will take a good deal of demonstration and a long time of preaching before it will be eradicated. Nevertheless, it is true that the popular belief is probably as erroneous as was the one that "bled" pine is inferior to "unbled." The extensive tests made by the Division of Forestry have accumulated a large array of data which indicate that this notion is wrong in Pines, and we can see no reason why it should not be wrong with all other kinds of timber. Nay, not only may young timber be stronger than old, but we can assert the still more audacious reversal of the notion that sapwood is weaker than heartwood. Ample ocular demonstration and experiment will be required to establish this fact beyond cavil, but we can even now supply arguments why this fact should be so.

That strength and specific weight in the same species are almost synonyms has been amply proven by our experiments on pine. Specific weight is, of course, dependent on the amount of cell-tissue within a given space, and the greater weight of the cell-tissue is again dependent on the larger amount of cell-wall, and since the darker bands of summer-wood in the annual ring are composed of thick-walled cells (hence the darker color effect) the greater or less amount of summer-wood determines the greater or less weight.

Now, it is well known that the wood-cells formed by the cambium of the tree, when once full grown—that is, at the end of the first season—do not change in size or form; once formed they remain the same in all their mechanical arrangements and relationships, and hence the strength of the particular annual ring remains the same, no matter how many more annual rings are formed around it. We do notice a change when the sapwood changes to heart-wood, but this change does not, as far as we know, involve any change in form or size of cell or cell-wall; it is chemical in its nature, and whether it be infiltration of the cell-wall with chemicals or partial disintegration of the cell-wall itself, it is not conceivable that such change adds to the strength; if anything, it rather detracts from it.

To return, however, to the proposition that the amount of summer-wood in an annual ring determines its strength, and hence the amount or proportion of summer-wood determines the strength of the given piece, we come to the conclusion that the strongest wood is formed when the most summer-wood is formed, which is at the time of thriftiest growth. As a matter of fact, since the growth is a direct function of the amount of foliage, this occurs in most species normally when the crown is best developed, which is usually between the thirtieth year of the tree's life and the eightieth, or ninetieth at most. Hence, if we split up a bolt of a normally grown hundred-year-old Pine into sticks along the radius from centre to periphery, we shall find that the sticks that come from a zone representing the wood of the fortieth to sixtieth year is the strongest, and as we near the periphery or the centre we find the wood, as a rule, decreasing in strength. Hence the trees of Mr. Schober, which have attained the age of fifty years, if properly sub-

jected to experiment, would give as good data as if he waited another forty years.

There is, however, one caution to be observed when experimenting with young wood—that is, with sapwood. This contains always a larger amount of water in the lumen as well as the cell-wall; it shrinks more in drying, and during the process of shrinking, unless carefully dried, it is more liable to develop season checks, which become a source of weakness. It is this greater liability to checking that has probably given rise in part to the experience that sapwood is weaker than heartwood in practice; this weakness is, however, a result of treatment, not an inherent quality of the sapwood as such, and, at least, for purposes of experiment it can be avoided, whatever may be the difficulties in practical use.

This fact, which we hope soon to demonstrate with figures of actual experiments, has an important bearing on our forestry problem; it secures for the despised sapling timber a greater appreciation.

As to durability, we know, to be sure, that sapwood, hence young wood, is more liable to decay because of the food elements contained in it, but the coniferous species under consideration would at fifty years furnish all the heart-wood material needful for experiment, while the fuel value of the dry wood could be determined with as much certainty as from older trees.

Division of Forestry, Washington, D. C.

B. E. FERNOW.

Ornamental Shrubs for Nebraska.

To the Editor of GARDEN AND FOREST:

Sir,—Any one interested in ornamental gardening, in visiting the west, cannot fail to notice the extreme dearth of material which both public and home grounds present. A few trees of Cottonwood, Box Elder, Soft Maple, and possibly some others, with here and there a shrub, make up the sum total of ornamental planting ordinarily found. The reasons for this are various, but the condition chiefly arises, no doubt, from the fact that in a new country, as Nebraska is, the people are first concerned with providing themselves with the needful things of life. Æsthetic features come as a secondary and later consideration. The people of a new country are not, as a rule, people of means, and all matters of mere adornment must be at first largely neglected. A second reason lies in the fact that this climate differs widely from the climate of those sections from which most of the people have come, and ornamental plants familiar to them in their old homes often fail utterly here. Nurserymen, too, are much in the dark in this matter. They have been busy providing the more needed varieties of fruit and forest trees, and are often at a loss when asked to recommend trees or shrubs suitable for lawn planting. There are plants that will endure this climate. It is simply a question of finding out what they are. A few well-known shrubs, such as the Lilac, Missouri Currant and the hardier varieties of Spiræa, are known to succeed; but further than this most of us know little.

In order to throw further light upon this question a number of ornamental shrubs were included in the Experiment Station planting the past spring, and the following notes will serve to show something of their probable value as judged at this early date. It should be said, however, that the planting season was unfavorable in that it was followed by a more or less continued period of dry weather, and many plants undoubtedly died which might have survived in more favorable seasons. Furthermore, since this represents but one season's growth we can say nothing yet as to hardiness.

The Sand Cherry promises to prove one of the most satisfactory low-growing shrubs for this climate. Since it is native of the plains it must prove perfectly hardy. Its foliage is bright and attractive, and at date of October 26th, after a number of freezing nights, on some of which the thermometer had fallen below twenty degrees, the plants still presented a fresh and green appearance. Its low-growing habit will render it useful for filling out or banking groups of larger plants. Its fruit also possesses some value. The plants received under the name Improved Dwarf Rocky Mountain Cherry—which are the oldest on our grounds, and identical with the Sand Cherry—have this year shown very attractive autumn tints, a feature which few plants possess in this climate.

The Amour Tamarix seems to be one of the most useful shrubs for our climate, judging from the plants on our own grounds and older ones seen at other places. Those set at the station grounds last spring have thrown up many shoots from the roots, and now form attractive shrubs three feet or more high and as many broad. The finely cut feathery foliage still remains green and attractive, being unhurt by frosts which

have defoliated many other plants. The twigs of these young plants have a bright reddish color and promise to give good effects in themselves during winter.

Rosa rugosa has made a very satisfactory growth. Its firm rugged foliage is still untouched by frost and presents a very pretty appearance.

Rubus crataegifolius has made a very strong growth, and even at the end of this one season would give very good effects upon the lawn. Its foliage is still attractive, and, like the Sand Cherry, it is showing some good autumn coloring. From present knowledge these two and the Sumach are all that can be recommended for this purpose. The leaves of most of our trees give but a yellow and sickly appearance, instead of the bright and gorgeous colors so often seen in the woodlands of the east.

The Button-bush has made a good growth, and notwithstanding its very recent advent from the east, where it was purchased, has been a pretty sight during the whole summer. The leaves are now all killed, though many are still clinging to the plant. It has done its duty well during the summer, but evidently succumbs to the first frosts of autumn. Whether it will stand our winters yet remains to be seen.

Among those which have made a fair growth during the season the following may be mentioned: The Russian Oak, Lonicera media, L. Germanica, L. splendens, Acer Tartaricum, var. Ginnala, Caragana arborescens, Russian Philadelphus, the Tree Cranberry, Purple Fringe, Purple Wistaria, Berberis Amurensis, Pyrus Toringo, Russian Hop-tree, Rubus laciniatus, Viburnum Lentago, V. dentatum, V. cassinoides, Double-flowered Deutzia, Deutzia gracilis, American Evonymus.

Those which have died or made a poor growth are: Potentilla fruticosa, Ampelopsis Veitchii, Pawpaw, Chinese Barberry, Berberis Fisheri, B. laxiflora, Viburnum acerifolium, V. nudum, V. lantanoides, Clematis Jackmanni, the Beech Plum and Rubus spectabilis.

Agricultural College, Lincoln, Neb.

Fred W. Card.

Exhibitions.

Autumn Flower Show in Chicago.

AT the annual fall exhibition of the Horticultural Society of Chicago last week, Chrysanthemums naturally were the chief attraction. Cut flowers predominated, and the white variety which received the award for the best vase of forty blooms was the Mayflower, shown by Stollery Brothers, Argyle Park, Illinois. The large, fluffy flowers are of the Japanese incurved form, the petals somewhat wavy-twisted, the lower ones reflexed. The flower has many good qualities, and it has already become one of the leading market sorts, but in the opinion of many persons for commercial use it did not equal Mr. Buckbee's Mrs. Henry Robinson, which stood second in the same class, but first when competing in a vase of six. The flowers are not as broad and open as those of Mayflower, but they are deeper, the broad incurved petals sufficiently compact to round up into a neat head. In this respect it was one of the most desirable white flowers shown and may take a place among the very best of the early sorts, ranking with Ivory and the Queen. Niveum, which two or three years ago gained much favor, appeared in limited number and holds its own well. Some of the flowers were of the very best form and of immaculate whiteness. Mrs. Perrin, a new pink, incurved, shown by E. G. Hill & Co., was easily the first of this color in a vase of forty blooms; while Yellow Queen, exhibited by Pohlman Brothers, Morton Grove, and H. L. Sunderbruch, by Buckbee, led in their color—the latter, with its large open flowers of a rich, shining yellow, being specially good. Peter Henderson & Co. sent several vases of the Pompon or Chusan Daisy-flowered kinds, to which one would at times resort for the relief they afforded when contrasted with the large-flowered kinds and their bewilderment of names. But a tiny flower like the old Model of Perfection is a gem in itself, and more enjoyable in its completeness than some of its big, disheveled congeners.

The display of specimen and standard plants was not as large as usual. Most of them came from Vaughan & Co. and from the garden of Martin A. Ryerson. Of the specimen plants, one of Constellation, covered with good-sized flowers of a delicate pink, was noteworthy, and quite as good was one of The Bard, a very rich, dark crimson flower, one of the best of its color, which is as deep as that of Cullingfordi (which I did not observe at all in the exhibit), and better than George W. Childs, since the flowers are without the traces of bronze or yellow apt to be seen in the latter too prominently in some stages of its anthesis.

There were the usual eccentricities in the way of grafted plants and those with stems intertwined. On the same stock were the Mutual Friend and The Bard, white and crimson. More pleasing were William R. Smith, a pink, and The Bard. Some neat effects may be produced in this way when harmony of color and form is secured, but to make such treatment most effective those who arrange colors need to bear in mind a principle of optics long ago enunciated by Thomas Young, that the colors which produce the most agreeable effect when placed beside each other are those which approach nearest to white when combined.

Of the tested seedlings, the most approved, Mrs. W. C. Egan, came from Fred Dorner & Sons, Lafayette, Indiana, and obtained the silver medal. It opens as a light pink, and changes gradually from the centre outward to a light creamy yellow. Some of the oldest heads looked almost white. They are semi-compact, flattened hemispherical and six to eight inches across. It is of the exhibition type, with broad incurved petals, and of fairly good form as an ideal Chrysanthemum. Its keeping properties will commend it to florists, for a label stated that the oldest flower had been cut two weeks before, and it was still looking fresh and had but a trace of brown on the edges of some of the lower petals.

The exhibit, as a whole, showed a tendency to breed and cultivate the more compact or even ball-like forms instead of the wider or more open heads, which give to the Chrysanthemum one of its most distinctive characteristics. As one expressed it, they are too Dahlia-like. It is the commercial or transporting qualities which are in the ascendant. This is commendable from the florist's point of view, for he must make the most of his investment. But it is a question how far the artistic should give way to utilitarian features. No doubt, the bizarre, unkempt heads offend by excessive irregularity; it is well to shun, on the other hand, those in which each petal looks as though it had been combed into its place and all irregularities clipped off with shears.

The largest contribution of Carnations came from H. Weber & Sons, Oakland, Maryland, but they were too late to be entered for competition. They were exceptionally well-grown plants, some of them introductions of 1895. Several seedlings, tested and first year, were entered for competition. The one taking the prize was from F. Dorner & Son, a tested seedling, Mrs. George M. Bradt. It is similar to Helen Keller, the red flakes broader and more showy, but not flushing. Some of the blooms slightly exceeded three inches in diameter. The calyx was not as deep as in some varieties, but about like that of Helen Keller, of strength enough to hold the petals firmly.

One of our native plants was shown, the Blue Violet. There were single and double flowered forms. The latter, when the petals were much multiplied, could hardly be considered an improvement. It was interesting to compare them with their field representatives. The flowers were of a deep purple-blue. The leaves had gained in thickness, and were of a rich green color. They were of two types, broad-leaved, as in the Cuculate Violet, and a longer form so heart-shaped as to suggest a derivation from cordate-leaved forms of *Viola sagittata*. They showed how soon cultivation may change species so as to make it difficult to determine their parentage.

The usual display was made of decorative plants, like Palms, Orchids, Nepenthes, etc., and one Stag-horn Fern which deserves mention. This specimen came originally from the World's Fair collection, and was shown by the gardener of George M. Pullman. It had grown considerably, being now about four feet across, and was a splendid example of what can be made of this Australasian species, *Platycerium alcicorne*.

Chicago, Ill.

E. J. H.

American Institute Chrysanthemum Show.

THE flower show provided by the American Institute last week was an excellent illustration of the fact that the interest of such an occasion does not depend upon mere size. The hall of the Institute is only of moderate size, but the collection included flowers which represent the choicest varieties of the season raised by the best growers of this section. Since there were no money prizes the stranger might have wondered what inducements led growers to send their newest and best flowers to a small exhibition in a comparatively out-of-the-way place; but the reason was plain when one saw the class of visitors. These seemed all to be not only devoted, but intelligent and discriminating, lovers of flowers, and the growers of Roses, Chrysanthemums and Carnations had sent the products of their highest skill where they knew they would be properly appreciated. While the judges were passing judgment on the flowers, Dr. Hexamer, in an adjoining room, presided over an

animated symposium on the Chrysanthemum, in which brief addresses were made by H. W. Hales, of Ridgewood, New York; C. L. Allen, of Floral Park, New York; Leonard Barron, editor of *The Florists' Exchange*, and Mr. J. N. Gerard, of Elizabeth, New Jersey. Mr. Hales' address gave an account of the introduction of the Chrysanthemum from the east, and advocated the more extensive growing of Pompon varieties. Mr. Gerard advocated the growing of outdoor plants. Mr. Allen said that in old Long Island places there were many very hardy varieties growing, and one of the most interesting floral spectacles of the year was the masses of these plants in late October. He advised a thick mulch of tobacco-stems and situations where no water could settle at the roots of the plants. Mr. Barron gave a lecture on the geographical distribution of the Chrysanthemum in Asia, explaining that the so-called Japanese and Chinese forms were only different divisions of the same family. Mr. Barron exhibited some beautiful varieties of Pompons grown by himself.

It is hardly worth while to specify particular flowers or varieties at the exhibition where all were of such even finish and purity of color. The admiration attracted by Mr. Spaulding's seventy-two blooms on boards proves that there is more than one satisfactory way of exhibiting flowers, and that while single blooms in small vases and great masses of flowers in large ones are certainly valuable, nevertheless the old way is useful as a supplement to the modern plan of showing the stems and foliage. There was not room for a large display of plants, but specimens of William H. Lincoln and Cullingfordii by Mr. A. M. Flagler, of Mamaroneck, New York (W. Cowen, gardener), were both worthy of mention in a good collection of twenty-one plants. Cultural certificates were awarded to Jos. E. Brown, Esq., for vases of twenty-four and of twelve blooms, and for twenty-four vases with fifteen blooms each. George H. Hale, of Bellport, Long Island, grew these fine exhibits, and there was not a poor bloom in the entire lot. Iora, the broad-petaled English variety Rose Wynne, Mrs. W. A. Bryant, a riotous yellow, Niveum, the bronze Charles Davis and Mrs. A. J. Drexel, and unusually good blooms of Pitcher & Manda were among the stars of this constellation. In the exhibit of fifty single blooms, and in sixteen vases of twelve blooms each, for which Dalledouze Brothers received a well-merited certificate, G. W. Childs, Major Bonnaffon, Dean Hole, Viviand Morel, Colonel W. B. Smith and the large yellow Georgiana Bramhall were conspicuous, while Eugene Dalledouze, Ivory and President Smith were probably the best in the seven vases exhibited by Mr. John Lewis Childs, a collection which also won a cultural certificate. Twelve flowers of Golden Wedding, exhibited by Messrs. Garrett & Rose, of Jersey City, and enormous blooms of Mrs. Jerome Jones, Philadelphia and Mayflower, exhibited by John N. May, were also features among the cut Chrysanthemums. A well-deserved certificate was given to Mr. Leonard Barron for an assortment of hardy Pompons, which showed how it is possible to decorate the outdoor garden in this climate in early November. Pitcher & Manda also displayed thirty varieties of Pompon Chrysanthemums, which were well worthy of the attention they received. For seedlings the awards were given to Mr. Spaulding for his pure white Japanese Chrysanthemum, Mrs. W. P. Raymond, and to Mr. John N. May for the new fancy Carnation, Lily Dean, a flesh-white flower delicately margined with pink. The salmon-pink Carnation, Fred Weir, was also certificated; this is a fragrant self-colored flower of good size, shown by Dalledouze Brothers. A vase of Bridesmaid, Mr. Dorner's new variety, made a striking show. These Carnations were exhibited by Mr. C. W. Ward, Queens, Long Island, and showed successful cultivation. The color is a brilliant pink, deeper than that of William Scott. The same grower also made a good display of Meteors.

Notes.

An interesting exhibition of Palms, Orchids and tropical plants by William A. Manda is now in progress at the Grand Central Palace, and will continue until the first of December.

A week ago the committee of the New York Florists' Club, acting for the National Chrysanthemum Society, awarded a certificate to one out of four varieties on exhibition. This was shown by Mr. T. H. Spaulding, and was named Golden Wonder. The flower is a deep yellow, with a centre of still deeper orange color, fading toward the tips to a sulphur-yellow.

In an editorial note of this issue the tenderness of the leaves of the Japanese Maple is spoken of. Much of the foliage of these trees was killed this year by severe early frosts before it

began to turn, but one of the oldest trees of this species in the country, standing in a sheltered position in Prospect Park, Brooklyn, still retains a large portion of its leaves in the latter half of November, which fairly glow in the sunshine with colors which words cannot describe.

Besides the awards which we have before mentioned in the Forestry Division of the Atlanta Exhibition, a silver medal has since been given to the Argentine Republic for a collection of native woods and plants, and one to the Republic of Mexico for a collection of over two hundred medicinal plants, well arranged and properly labeled. Bronze medals were also given to the state of Zulia, to the Republic of Venezuela and to F. X. Gartland for ornamental woods.

The newest offerings in the fancy-fruit stores are Gros Colman grapes, from Long Island hot-houses, at \$1.50 to \$2.00 a pound; strawberries, from California, costing sixty cents for a box holding less than a pint of the fruit; prickly pears, from Italy, in considerable demand on account of their decorative value in baskets of fruit, selling for sixty cents a dozen, and pomegranates, from Spain, at the same price. Small lots of peaches, from this state, bring forty cents a dozen.

In the Parisian markets and along the quays, where well-grown plants may be cheaply bought at almost any season, the dealers have potting-soil for sale in baskets containing, say, half a bushel. In this city amateur buyers of plants can buy potting-soil of local florists, but the small dealers, who supply the greater proportion of the plants that are grown in city yards and window gardens, might find it to their own profit, and certainly to the benefit of their customers, to follow this Parisian custom and provide good potting-soil to those who buy their plants.

During the warm days of the past week the delicate little lilac and white flowers of *Micromeria rupestris* opened as cheerfully as they did in July. Among the low-growing sub-shrubs in the rock-garden few are more valuable than this little Mint, with its long succession of flowers and its neat foliage with the odor and taste of Pennyroyal. Its prostrate stems, which turn up at the extremities, make a rounded mass less than a foot high at the centre, and in old specimens spreading over a diameter of two feet. It is perfectly hardy, and altogether a cheerful and useful little plant.

The lemon famine of six weeks ago, due to the loss of the Florida crop last winter and to the short supply of Mediterranean fruit, made extraordinarily high prices then. The new Sicily crop, which is now arriving, is abundant, and although no lemons are expected from Florida this season, and but few from California, prices are unusually low. The California lemon crop of the approaching season is estimated at 250,000 boxes, and the orange crop of the same state at 3,000,000 boxes. Some 3,000,000 boxes, or about 1,000,000,000 lemons, are consumed in the United States in a year.

During last week 34,415 barrels of apples came into the markets of this city, making a total of 309,752 barrels since September 1st, and 70,925 barrels more than arrived here during the same period of last year. After Albemarle Pippins, which are mainly exported, Snow or Fameuse apples of fancy grades bring the highest prices of all the varieties now in season. Northern Spy ranks next, and King and Wine-sap follow in the scale. One of the showiest apples occasionally seen in choice collections is York Imperial, or Johnson's Fine Winter, as it is known in the trade. Selected specimens of this fruit are of large size, flat, the clear yellow ground well covered with bright red markings in which distinct white dots occur.

Experiments in grafting Tomato cions on Potato stocks, as well as Potato cions on Tomato stocks, have often been carried on in this country. Of course, in the latter case, the Tomato roots do not produce potatoes, but the Tomato grafts may bear Potato flowers and seed. In a lecture on Potatoes, delivered before the Royal Horticultural Society lately, Mr. A. Sutton spoke of a Potato-plant grafted on a Tomato, in which the plant, after having produced a truss of flowers and several berries, seemed to have determined that it was its peculiar duty to produce tubers, and, therefore, several of these were started from the axils of the leaves. A picture of this plant showed half a dozen good-sized tubers growing along the stem.

Campbell's Early Grape, a seedling of Moore's Early, which is in turn a seedling of Concord, promises to be one of the leading competitors of that old and standard variety. A corre-

spondent of *The Agriculturist* describes the new grape as earlier than Moore's Early, with no tendency to shell off from the stem, so that it can remain on the vine weeks after it ripens. It has no foxiness, and the sprightly flavor is superior to that of the Concord. Its leaves are thicker than those of the Concord, and its growth is strong; the skin is thin but tenacious, the pulp is sweet from skin to centre and the seeds part from it readily.

The first exhibition of the recently organized Horticultural Society, held last week at Northampton, Massachusetts, was an encouraging success. Many Chrysanthemums were shown, mainly by Mr. E. P. Copeland, President of the Society, and noteworthy exhibits were a collection of decorative plants, most effectively arranged, from the greenhouses of Mr. E. H. R. Lyman (D. MacGregor, gardener); Chrysanthemums and cut flowers from the Hospital (J. W. Thornley, gardener); plants of educational interest from the Botanic Garden of Smith College (E. J. Canning, gardener). Of the florists' exhibits the most extensive were those of Mrs. Mann and A. Parks, while several other florists displayed good plants or collections of flowers.

Raupenlein is a preparation long known in Germany, where it has been used to protect trees from injury by caterpillars of the nun moth and other insects, and to some extent to prevent the winter-barking of trees by deer; it has also been used experimentally by the gypsy-moth commission of Massachusetts. Since this insect-lime or insect-glue is comparatively expensive, Professor Nason, of New Brunswick, New Jersey, at the request of Professor Smith, the entomologist of the station there, has obtained as the results of some experiments a substance sufficiently similar to it to warrant comparative tests. The new product is called Dendrolene, and Professor Smith gives an account of tests made with these substances, both of which are crude petroleum products which resist heat to a considerable extent and remain sufficiently viscid at ordinary temperatures, so that they do not flow and never become soft enough to run much in the sun. They can be applied to trees with a paddle or trowel and distributed by a stiff brush. When the entire surface of the trees is covered with either of these products the buds will not develop, but where trees are covered from the surface of the ground to the buds and the buds are left free there seems to be no difference in the amount of foliage or the health of the tree. A thin application of either will last six weeks, and an application a quarter of an inch thick has lasted five months in good condition. After a time, however, the German product becomes so hard that a light, rapidly moving insect can move over it, although where it was put on thick enough it was still soft enough to hold any creature that ventured upon it at the end of six weeks. The Dendrolene loses some of its sticky character in that time, but it continues to have a greasy surface and remains a perfect barrier against insects which attempt to cross it. The material can be employed for a variety of purposes, as, for example, against scale insects. If the trunks and larger branches of trees are covered the application will prevent the emergence of the young from beneath the parent scales. Spread over the trunks of Peach-trees early in the season it will prevent oviposition by the Peach-tree borer. This is a satisfactory way of preventing injury to Peach, Apple, Quince and Pear trees from the attacks of either the round or flat-headed borer. Applied from the middle to the latter part of May to the trunks of trees after the loose bark is scraped off, it forms a surface that no insect can light upon or can remain upon without being killed, and one that no young larvæ can penetrate. For this purpose the Raupenlein would, perhaps, be better from its tendency to become hard, and where insects are actually in the tree none of them could emerge through the barrier. The dendrolene will probably answer every purpose if put on a little heavier. Where the cankerworm is troublesome a band of either substance a foot wide and half an inch thick on the trunk below the point of branching would prevent either the male or female caterpillar from crossing, and it would remain intact until the attack is over. Where shade or fruit trees have been cleared of eggs during the preceding winter it would be a barrier against the vaporero-moth and the bag-worm, and also against the plant-lice which crawl up the tree-trunks in the spring and down again in the fall. A thorough application would prevent the emergence of the Pear psylla, and an application made on Apple-trees before they are in blossom would prevent the emergence of any codling-moths that may be in the pupa state beneath it. Altogether, the range of usefulness of these substances is very wide, and a coat of dendrolene might be a perfect protection during the winter when mice, hares and other animals gnaw the bark.

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLE:—Schools of Horticulture.....	471
The California Fan Palm. (With figure).....	472
A Coppice of Pine.....	P. J. Fireman. 472
Notes on some Arborescent Willows of North America—IV.	M. S. Febb. 473
FOREIGN CORRESPONDENCE:—London Letter.....	W. Watson. 473
PLANT NOTES.....	474
CULTURAL DEPARTMENT:—Notes on some Species of Cucumis, Professor Alexander MacElwee.....	475
Carnation Notes.....	W. N. Craig. 476
Seasonable Notes on Roses.....	W. H. Taftin. 476
Notes from Baden-Baden.....	Max Leichtlin. 477
CORRESPONDENCE:—Golden-rod Killing Horses.....	J. L. Scott. 477
Notes on the Western Apple Crop.....	F. A. Waugh. 478
The Lily Melpomene.....	E. O. Orpet. 478
Poison Sumach Once More.....	Timothy E. Wilcox, Surgeon, U. S. A. 478
EXHIBITIONS:—The St. Louis Flower Show.....	478
Palms at the Central Palace.....	479
RECENT PUBLICATIONS.....	479
NOTES.....	480
ILLUSTRATION:—Palm Cañon in San Jacinto Mountains, Fig. 65.....	475

Schools of Horticulture.

DURING the Christmas holidays last year what had been announced as a School of Horticulture was held at Fredonia, New York, under the Experiment Station Extension Bill of this state, which was passed during the legislative session of 1894. The conspectus gave promise of an interesting meeting, and the reports which were afterward secured from students and instructors left no doubt that this novel venture had justified the hopes of its promoters. Some account of the distinctive features of this meeting will be found on page 21 of the current volume, from which it will be seen that the purpose of the gathering was more to confirm some of the principles of horticultural science than to give instruction in the working details of any of the branches of horticultural practice. Several institutes of the kind have been held since that time, and this purpose has prevailed in all of them—that is, the aim has been to present fundamental knowledge rather than directly applied knowledge. This does not mean that Professor Bailey, who conducts these schools, underestimates the value of manual skill, or of the most approved practice as based on experience; it means rather that in his opinion these methods of work can be learned elsewhere, and that in the few hours at command horticulturists will receive greater benefit by having their attention turned directly to the study of nature so as to ascertain the underlying reasons for the various operations in greenhouse and garden, nursery and vineyard.

The latest one of these meetings was held early in November at Jamestown, New York, and from the reports given in the papers we are glad to learn that the original plan has been strictly adhered to. Reports of the first institute laid stress on the remarkably stimulating effect upon the minds of the students, some of them well along in years, by what were called Observation Lessons. The simplest objects, like the twigs of a fruit-tree, became clothed with a new interest as soon as the class began to look at them closely and critically and were called upon to tell what they saw. The result showed that they had discovered a hundred facts and relations which they had never dreamed of before in objects with which they had been brought into familiar contact almost every day of

their lives. The same effects were manifest in the Jamestown Institute. In the session devoted to the study of insects, for example, Professor Slingerland had furnished each member with a squash-bug and a grasshopper, not only to illustrate much of his address, but to give an opportunity for each one to tell what he saw, and the observations made were always of remarkable interest. Professor Slingerland's address was practically a view of the insect's relations to nature from its own standpoint—that is, he explained how it feels, sees, hears and generally how it lives, moves and has its being, and it is said that the class, a large one, was held for two hours in rapt attention. Soils, fungi, flowers, fruit and other subjects were studied in the same manner, and the fact that such genuine enthusiasm is kindled seems to show that all that is needed to arouse a living interest in these matters is to bring students into direct contact with natural objects and let them make their own discoveries under proper direction. How sincere and widespread this interest was may be understood when it is known that the high school in a city of 20,000 inhabitants was dismissed for the purpose of enabling the teachers to attend the observation lessons on flowers as directed by Professor Bailey. Ninety-eight persons, forty-three of them women, were in regular attendance. Besides these there were others who were drawn to particular sessions by interest in the subjects discussed, and the attendance was so large at times that it was difficult to obtain sittings in the commodious hall. The students were promptly at their posts and alert to make inquiry. They had evidently carefully followed the instructions to read up and investigate the subject to be discussed before the sessions began. They made free use of note-book and pencil, and they passed creditable examinations on the different lectures.

No one imagines, we may here repeat, that graduates from a horticultural school, with a course extending over three or four days, are accomplished horticulturists. It is true, however, that any one who is stimulated to begin the direct and active study of nature has set his face in the right direction, and that if he continues he must acquire more and more fundamental scientific truth, and this means he must become more and more an intelligent worker in the art which is founded on this truth. Professor Caldwell did not attempt to make expert chemists out of his class, but he explained to them how a farmer or gardener could go to work in a sensible way to ascertain what particular fertilizers were needed in his special soil for a given crop. In the same way Professor Lodeman instructed his hearers how they might study the fungous enemies which attacked their various crops, so that they could give the reasons why this or that remedy should be used in particular cases. Professor Roberts' address on plows and plowing; the illustrated geological history of the Jamestown region, presented by Professor Tarr; the outline of the processes of plant-nutrition, by Mr. Durand, and the discussion on the theories of plant-evolution, by Professor Bailey, were all illustrations of the same purpose—to give knowledge and inspire a thirst for a knowledge of the unvarying natural laws which must be heeded if the highest success in cultivating the soil for any purpose is reached. Above all, the taste of knowledge received will create a hunger for more, and if it does not have immediate value in helping farmers and gardeners to adjust their practice to the teachings of science, it certainly will save them from many costly mistakes by showing them the futility of attempts in certain directions which might seem inviting to those who have less knowledge.

It is pleasant to record the fact that instruction of such a direct and dignified character is provided for all who are interested in horticulture in western New York, and the fact that there are so many communities in that section of the state where these institutes can be held with the assurance that the people will take an enlightened public interest in the study of nature and in its application to the affairs of rural life. The law establishing these schools was a good

one. They are conducted on the most approved lines of university extension. No doubt, both students and instructors are delighted with the success of the experiment, and it can be safely asserted that the money which is necessary to carry on these schools is wisely expended.

The California Fan Palm.

THE universal planting of this tree in all the towns and villages and along the roadsides of south-western California will, in a few years, convert that part of the country into a great Palm grove. One of the rarest of our trees, and found only in a few remote cañons on the desert slopes of the coast ranges in the extreme southern part of the state, the California Palm, has shown itself wonderfully adaptable to cultivation, and specimens nearly as large as any of the wild trees are now found in several California gardens (see GARDEN AND FOREST, vol. vi., page 535) as well as in those of the French and Italian Riviera, where this tree has been grown with great success.

Those of our readers who know the California Palm only as a cultivated plant will be interested, perhaps, in the illustration on page 475 of this issue, which is the reproduction of a photograph of a part of the large grove in the Palm Cañon of the San Jacinto Mountains, as it shows the habit and manner of growth of this noble tree and its surroundings in its mountain fastnesses.

A Coppice of Pine.

IN connection with the annual meeting of the New Jersey Forestry Association on November 8th and 9th, a most interesting trip was made into the so-called Plains.

As the map in the Report on Forestry of the Geological Survey of New Jersey for 1894 shows, the whole region south of Lakewood in a belt of twenty-five to forty miles' width from the seashore is mostly forest of coniferous growth, the larger part Pines, which occupy the sandy plain. Within this extensive forest region, which in earlier times furnished considerable timber, then charcoal, and now mainly smoke during the fire season, there are found two areas comprising about 15,000 acres, which are separately known as the East Plains and the West Plains, although lying south and north of each other, separated by the east branch of the Wading River, and easily reached in a drive of a few hours from Shamong, now called Chatsworth, a station on the New Jersey Central Railroad.

The sandy Pine-barrens are covered with a growth of Pitch Pine, *Pinus rigida*, associated in the better situations with Two-leaved or Short-leaf Pine, *P. echinata*, the Jersey Scrub Pine, *P. Virginiana*, with Black Jack and occasionally Post Oak and other species of the Black Oak tribe. Here and there a Red Cedar occurs, and where a depression with impermeable subsoil gathers moisture enough, White Cedar swamps, with *Magnolia glauca* and Red Maple undergrowth and a few towering Pines, add interest to the landscape, and value, too, for the White Cedar is now undoubtedly the most valuable timber of the south Jersey forest, and the fruit of the Cranberry-bog, associated with it, the most valuable crop. Here gradually, there abruptly, we notice a change in the character of the tree-growth as we approach the region of the Plains.

This region is a sandy Pine-barren, just like the surrounding country—that is to say, it is an undulating plain of almost pure white sand with a poor growth of Pine; the visible difference between the plains and the surrounding country being mainly the more stunted appearance of the trees. But the great interest lies in the fact that here the student of forest-conditions and tree-growth can have the rare sight of a coppice of Pine, almost the entire growth being sprouts from the stumps of *Pinus rigida*—She Pines, as the native calls this growth. Mr. John Gifford, who has explored this region for the Geological Survey of New Jersey, informs me that "the age of most second-growth shoots is about twelve years." This, of course, does not

limit the age of sprouts, unless it be shown that after twelve years they succumb naturally and without the use of fire.

As is well known, conifers, as a rule, and especially Pines, do not sprout from the stump, or if they do the sprouts are usually not of long duration. But here we find this Pine not only a vigorous sprouter, and persistent, but that under conditions which would discourage any other tree from waging the uneven battle for existence.

Not only is the condition of the soil unfavorable, a very fine, although compact, sea sand, such as will support only a poor growth at best; not only is the subsoil more or less impenetrable, or else constituted of such coarse gravel as to predicate a droughty condition (by absence of capillary action), but fires are ravaging, if not yearly, at least at brief periods, this portion of the Pine country without mercy, and sooner or later the trees which have succeeded in establishing themselves and have escaped, perhaps, the fires of several seasons, are finally leveled again. Yet the roots do not give up the struggle, but send forth a large number of sprouts, which at present, two years after the last fire, cover the desolation with a green bush-like growth, assisted by Scrub Oaks, Black Oaks and Laurel, *Kalmia latifolia*. Here and there a patch of trees has escaped the fire, stunted in form, but quite vigorous and bedecked with closed cones, although most of them with imperfect seed. Such trees, eight to twelve feet in height and four to five inches in diameter, may be twenty to thirty years old, or else more than one hundred, according to the ills to which they have been exposed. One old root which was pulled up, with a diameter of not more than five inches at the collar, showed two sprouts, both dead, each about two inches in diameter. These had evidently succeeded in weathering all ills for many years, the oldest eaten out by the fire, the younger counting eighty-three rings, pointing to an age of possibly 150 years for the root itself.

The gradual process of decadence was seen in some of the older trees, the branches of which had been killed by the last fire, but from the trunk a dense crop of young twigs was produced by dormant buds, for which this species is noted; at the same time sprouts from the foot of the tree are thrown out. The next fire will probably kill the new growth and the life of the trunk, which, finally weakened at the base, topples over, while the root continues to sprout, again and again replacing the killed progeny, until it, too, is exhausted or a lucky accident allows one or more to develop into trees.

Much speculation has been indulged in as to the causes of the stunted growth. Tradition holds that there never existed a better growth. There was no time during the hurried trip to determine how far an impenetrable subsoil, which evidently exists here and there, gives rise to such growth, or else a gravelly substratum near the surface, which, while permitting the moisture to percolate, does not retain or pump it up by capillary action, and thereby produces a droughty condition of the upper strata. Nor could an estimate be formed, how far the repeated fires, added to unfavorable physical soil conditions, were chargeable. In one place a road appeared to have been able to prevent the spread of fire across, and as a consequence the "plains" condition was abruptly changed to the common "barrens" condition, with trees thirty to forty feet in height tolerably thrifty. This would indicate that after all, if the fires were kept out, normal, though poor, tree-growth could maintain itself.

That the tree-growth in the sandy Pine-barrens does not need to be so uncommonly unthrifty, provided acceptable conditions are maintained and fire kept out, was shown by the remnants of an abandoned nursery, where White Pines, Fir, Norway Spruce and European Larch had been allowed to grow up in the rows for thirty years and presented a grove of trees of quite acceptable sizes, heights of over forty feet and diameters up to eight and ten inches.

The subject of forest fires naturally formed the principal

topic of discussion at the meetings of the Association, and it was agreed that the question of profitable use of these vast areas, either for tree-growth or for berries and sweet potatoes, could be deferred until the means for the reduction of fires were provided, which will be the main aim of the association.

Division of Forestry, Washington, D. C.

B. E. FERNOW.

Notes on some Arborescent Willows of North America.—IV.

SALIX CORDATA MACKENZIANA. Hooker. *Fl. Bor.-Amer.*, ii., 149. Bebb, *Brewer & Watson Bot. Calif.*, ii., 86. *S. Mackenziana*, Barratt, "No. 50 *Herb. H. B. & T.*" (Hooker, Barratt and Torrey distribution of the *Fl. Bor.-Amer.* types). Andersson, *Monog. Sal.*,* p. 160, where *S. Mackenziana* is treated as a subspecies of *cordata* (1) and *DC.*, *Prod.*, xvi., part ii., 252, where it is treated as a hybrid between *cordata* and *restrata*.

Great Slave Lake and Mackenzie's River. Dr. Richardson.

Leaves lanceolate or oblanceolate-acuminate, two to three inches long, smooth, dark green above, paler, but not glaucous beneath, margin at first finely and obscurely serrulate at length nearly entire; petioles slender; stipules small but rarely absent; staminate aments sessile, the naked brownish tips of the scales showing dots of color imbedded in the cylinder of white wool which wholly conceals the rachis; fertile aments in comparison usually destitute of any such vesture, very shortly, but distinctly peduncled with three to four small bracts at base; capsules glabrous, long pediceled, the pedicel six to eight times the length of the gland, scales thin, tawny, sparsely villous and in age inconspicuous; style distinct, stigmas emarginate.

Plains of Idaho (Dr. Palmer) and southward in the mountains to Lake County, California (Dr. C. L. Andersson).

A small tree, the young twigs of which are the color of pipe-clay and highly polished. Older branches said to be yellow, and the whole tree in habit to resemble *Salix amygdaloïdes*. The two seem to be frequently confused, either from this resemblance afield or from the very open fruiting aments of *Mackenziana*, with their inconspicuous scales at the base of the slender pedicels being so disguised as to real character. In extreme forms, such as are described above, *Mackenziana* is a rare Willow, but shading off from these the forms which connect the extreme with ordinary *cordata* are very common. All taken together, the type of the variety and allied forms may be regarded as representing the Rocky Mountain phase of *S. cordata* as distinguished from forms of the east and west; corresponding, as it were, with *S. lasiandra caudata* as distinguished from *S. lucida* east and *S. lasiandra* west, or *S. flavescentia typica* as distinguished from *S. discolor* east and *S. capreaeoides* west, only that the difference is less pronounced, being wholly within the limits of a single species.

SALIX CORDATA, var. *LUTEA*.—Leaves lanceolate or ovate-lanceolate, acute or acuminate, one to one and a half inches long, obscurely dentate or entire, silky when just expanding, soon smooth, pale green and shining above, glaucous beneath; stipules small, lunate; aments appearing before the leaves, closely sessile, short, densely flowered; capsules shortly pediceled; pedicel four to five times the length of the gland, barely twice the length of the crisp-villous scale.

SALIX LUTEA, Nutt., *Sylva*, i., 63, t. 19. *S. cordata angustata vitellina*, Andersson, *DC. Prod.*, xvi., part ii., 252.

Moose Jaw, Assiniboia, Macoun, 1880; Old Wives' Creek, Assiniboia, May, Macoun, 1895; on White Mud River, Assiniboia, near United States boundary, Macoun; Saskatchewan, Bourgeau (fide Andersson); Colorado Hall and Harbour, N. 524, as to the pistillate specimen only!

"A small arborescent Willow which at first glance ap-

pears nearly allied to the common yellow-twigg'd *Salix vitellina*; but it never grows so large. Remarkable for its smooth bright yellow branches (Nuttall)." The concurrent testimony of those who have seen this Willow growing is that its bright yellow branches give it a distinctive appearance, but, apparently, very little reliance can be placed on any peculiarity of this kind which *S. cordata* may present in the Rocky Mountain region. Dr. V. Havard, Surgeon, U. S. A., sends from the Little Rocky Mountains, Montana, autumnal leaves only of what seems genuine *S. cordata*, with the note, "bark of the larger stems glistening white." It may still be possible that as we know the leaves of *S. lutea* only as accompanying fruiting aments that these leaves of Dr. Havard's—two and a half to three inches long, one-half to one inch wide, rounded or cordate at base, distinctly serrate, and with large orbicular stipules—may represent, after all, the fully developed foliage of *S. lutea*.

Rockford, Ill.

M. S. BEBB.

Foreign Correspondence.

London Letter.

CHRYSANTHEMUMS are the flowers of November. They reign supreme in every garden, they occupy the attention of almost every cultivator, and they are a source of pleasure and interest to thousands who flock to exhibitions to see them, in spite of unpropitious weather. The two principal exhibitions of Chrysanthemums held in the Metropolis annually have just taken place, one at the Crystal Palace, on the 2d, the other at the Aquarium, Westminster, on the 5th, 6th and 7th instant. Both exhibitions were exceptional in the high quality of the flowers and plants shown, and especially so in the extraordinary number and variety of Japanese flowers represented. Every year places this section of Chrysanthemums further and further ahead of all others in popularity. Not only do exhibitors rely most upon them for success in prize-winning, but visitors spend far more time in examining and admiring them than over any other section. One might almost assert that the majority of those who admire Chrysanthemums would not grieve much if all except the Japanese varieties disappeared from cultivation.

For enormity of bloom some of the exhibits of Japanese sorts surpass this year all previous records. Mr. W. H. Lees, gardener to Mr. F. A. Bevan, Trent Park, Barnet, won the first prize at the Crystal Palace for thirty-six flowers; at the Aquarium he won the Challenge Trophy for forty-eight, and the Holmes Memorial prize for forty-eight flowers, a record in prize-winning at national exhibitions in this country. There were nine dozen Japanese flowers included in these three grand exhibits, and every flower was exceptional in size and finish. The best varieties were: white—Madame Carnot, Mrs. W. H. Lees, Madame Moulin, Mutual Friend, Mademoiselle T. Rey, Mademoiselle Marie Hoste; yellow—Phœbus, H. H. Sunderbruch, Monsieur Pankoucke, Sunflower; bronze-yellow—Monsieur C. Moulin; crimson—G. W. Childs, Madame G. Biron, Miss Dorothy Shea.

The incurved section was represented scarcely as well as in previous years, and the same is true of the other sections, among which I failed to find any flower specially noteworthy. I was informed by Mr. Cannell, who had taken the trouble to count the varieties represented at the Aquarium, that there were one hundred and seventy-five distinct named varieties of the Japanese, forty-six incurved, fifty Anemone-flowered, the most peculiar of all the sections, and about a score each of the reflexed, Pompons and single-flowered sections. This gives a grand total of three hundred and thirty named varieties exhibited at one place.

The plants were, as usual, unattractive, almost ugly, in their painfully trained balloon-like shapes or rigid tripods, each bearing three flowers. The beauty of a bush Chrysanthemum is never, or rarely, to be seen at an exhibition. There are plenty of them at Kew, which are pictures, be-

* The figure given, namely 91, plate 8, grossly misrepresents both the plant and the author's description. It could scarcely have been drawn from Dr. Richardson's specimens.

cause the branches are natural in pose and clothed with leaves, while the flowers are numerous on each plant and complete the picture. I know no plant, either indoor or out, which will grow into such a nice bush and look so beautiful when in full flower as a rationally grown Chrysanthemum.

A pretty arrangement of Chrysanthemums mingled with Crotons, Cocos Weddelliana, Bamboos, Ferns, etc., covering about eighteen square yards, won a prize given by the President to encourage the ornamental grouping of Chrysanthemums with other plants. Another interesting exhibit was a collection of big cut flowers, each on stalks two feet long, but it was not a success. There was abundance of high-class material at the Aquarium to make a beautiful exhibition, but in such a huge lumber-shed it is impossible to arrange flowers with happy effect. We are in the unfortunate position of possessing no suitable central exhibition hall for flowers in London, notwithstanding the fact that nowhere else in the world is there so much interest taken in horticulture or so much material available to make worthy exhibitions.

ORCHIDS AND CHRYSANTHEMUMS.—I saw in a shop in Regent Street the other day a combination of Orchids with Chrysanthemums. A cross about three feet long and six inches across the sections was formed of closely set flowers of a rose-purple Chrysanthemum. Upon this was a spray composed of about twenty large racemes of flowers of *Dendrobium Phalaenopsis* arranged with exquisite taste. The whole was a picture of bright purple, rich in variety of shades, novel in arrangement, and to persons who do not altogether object to formal flower-pieces it was most effective. It was designed for an occasion of mourning. On inquiry I was informed that its price was ten guineas.

PELARGONIUMS.—Mr. Cannell is still the leader of the Pelargonium cult. His group of flowers of Zonal varieties, which filled a large stage at the Aquarium, was one of the most meritorious exhibits seen in London this year. I have before recorded in GARDEN AND FOREST Mr. Cannell's methods of cultivation for the production of grand flowers of these plants in winter. Certainly he improves upon his practice every year. So far as I know he is the only nurseryman in the south of England who makes a specialty of the Zonal Pelargonium, and he proves, beyond all question, that when well managed we have no greenhouse plants to equal them for brilliant and continuous display of bloom in winter.

POTATOES.—Mr. A. Sutton, of the firm of Messrs. Sutton & Sons, Reading, recently lectured before the Royal Horticultural Society on the Potato. He sketched its history and development from its first introduction to the present time, and while he found little to add to what is already well known of the potato generally, his account of some experiments recently made by his firm, with a view to obtaining a new and disease-proof race, was of special interest. It appears to be of little avail to cross *Solanum tuberosum* with any other allied species, or even with botanical varieties of *S. tuberosum* itself. After numerous experiments of this kind, extending over some years, Messrs. Sutton have obtained no result of any promise. Disease attacked the hybrids at least as readily as the ordinary potato, and *S. Maglia* itself, which was specially selected as being the most suitable species to cross with *S. tuberosum* for the production of a disease-proof race, was almost entirely destroyed by disease last year in Messrs. Sutton's trial-ground. Our only hope of improvement, therefore, is in crossing and careful selection from the best—that is, disease-resisting sorts.

BEGONIA DISEASE.—Cultivators of Begonias, Gloxinias and other indoor herbaceous plants have recently become acquainted with a pest which attacks the leaves and flowers, causing them to curl and ultimately fall off, or so discoloring them as to render them very unsightly. The disease is generally supposed to be the work of a rust-fungus, but it is undoubtedly caused by a mite which has been determined by Mr. A. D. Michael, F. L. S., a specialist in Aca-

rina (mites), to be a species of Tarsonymus, a genus of extremely minute, almost transparent mites, known to be great destroyers of vegetable life, attacking healthy plants and soon reducing them to a very bad condition. *T. Bancroftii* is the "red rust" which attacks the Sugar Cane, sometimes practically destroying whole crops of the canes in the West Indies and Queensland. An account of this species, prepared by Mr. Michael, was published in the *Kew Bulletin*, 1890, p. 85. *T. Buxi* practically destroyed all the foliage of the Box-trees in some of the Italian gardens a few years since. The best cure for this disease, so far as our experience goes, is frequent fumigation with tobacco, say once a week, or if the plants cannot conveniently be treated in this way, they should be dipped frequently in a solution of tobacco and soft soap. The mite is not easily got rid of when once it gets possession of a plant, as it sometimes bores under the cuticle of the leaf. It breeds rapidly and will do much mischief in a short time if not eradicated. Mr. Michael recommends solutions of soap and sulphur, benzole or carbolic acid, preferring the last named for plants that will bear a solution of three ounces of fluid carbolic acid to a gallon of water. Badly infected plants should be burnt. I have seen whole batches of *Gloxinias*, *Gesnerias*, *Achimenes*, *Pentas*, *Justicias*, *Hebeclinums* and such like plants ruined by this pest in gardens where the nature of the disease was a mystery and all chance of cure appeared to be hopeless. I find it wise to fumigate with tobacco now and then as a preventive in all cases of plants which easily fall a prey to the attacks of this mite.

London.

W. Watson.

Plant Notes.

FAGUS SYLVATICA.—With the exception, perhaps, of the native White Oak, the last tree in the northern states to assume brilliant autumn colors is the European Beech. The leaves of this tree in the middle of November, and in some years a few days earlier, are bright yellow, then gradually grow darker and glisten like old gold and fade to a dull russet-brown, in which condition they fall almost at once from some trees, and on others remain until late into the winter. These changes do not begin until several days after the branches of the American Beech are entirely leafless. This late and beautiful change in the color of the leaves of the European Beech is a sufficiently valuable character to make the planting of this tree desirable here. Perfectly hardy as far north as the valley of the St. Lawrence River, it appears to flourish here as if it were in its own land, growing to a great size and living to a good old age. In some respects, however, the Old World species is a less beautiful tree than its American prototype. The bark of the trunk and branches is darker and the spray of the leaves is less delicate, so that in winter, although very handsome, it is a less cheerful and attractive object. The green of the leaves, too, is darker and less cheerful than that of our American tree, but they are richer and more lustrous, and in summer the European Beech is a more massive and imposing object. These peculiarities, however, do not make it appear out of place in an American sylvan scene, and there are few exotic trees that can be used in our landscape with less danger of introducing an inharmonious note.

ROSA SPINOSISSIMA.—It is worth noting that the foliage of the so-called Scotch or Burnet Rose, *Rosa spinosissima*, turns to bright shades of scarlet and orange late in the autumn in this country and that it does not suffer from hard freezing. The Scotch Rose is a very hardy plant with neat foliage and handsome and abundant fragrant flowers, with numerous beautiful varieties. It would be an excellent plant to use in masses with our native species in parks and large pleasure-grounds, as it composes well with them, looking as if it were to the manner born, but, unfortunately, the foliage here is so injured by insects early in the season that the plants, unless they are treated with insecticides, look for several weeks as if they had been scorched by fire.

Insects attack all the foreign Roses, with the exception, perhaps, of the Japanese *R. rugosa*, and it is not practicable to use them, therefore, except in small numbers or in gardens where they can be carefully watched and syringed as soon as the insects appear.

BERBERIS SIEBOLDII.—This Japanese species (see GARDEN AND FOREST, vol. iii., page 249, fig. 38) is a good shrub to plant when it is desirable to produce color-effects late in

is the Green or Bull Brier, *Smilax rotundifolia*, a native climbing shrub with long, tough, well-armed stems and large lustrous leathery leaves which turn bright orange and scarlet in the autumn. Few animals can penetrate or break through a thicket in which the Green Brier is growing luxuriantly, and if any one wants to plant an impenetrable barrier this is the plant to use where the soil is deep and moist.

DENDROBİUM FORMOSUM GIGANTEUM.—The Dendrobiums are, perhaps, more diverse in form and appearance than any other class of Orchids. There is a very wide range of beautiful forms between the *Densiflorum* type and the group to which the above variety belongs. This variety is one of the finest autumn-flowering kinds, with very large axillary flowers produced singly from the upper parts of the pseudo-bulbs. They often measure six inches or more in diameter; the color is a pure white, with the exception of the throat, which is orange-yellow. The clavate pseudo-bulbs often grow to a length of a foot or more and bear at the apex several leathery, dark green leaves. This is a tropical plant and requires considerable heat and moisture. It will do well in a basket in equal parts of peat, sphagnum and charcoal, and should be potted rather high. While growing, abundant watering is necessary. Like most Dendrobiums, this plant requires a good rest to mature the bulbs when the growing season is over.

NEPHROLEPIS EXALTATA PLUMOSA.—The Sword Ferns are among the most popular plants for home decoration, attractive, healthy and easily grown. They will do well under almost any condition, provided they are kept moderately warm and in a partial shade. The beautiful fronds of the old *Nephrolepis exaltata* are here divided into numerous feathery segments, which form large masses of greenery at the apex of the leaf. The lower pinnæ are more or less furcate, while the upper ones are cut out into numerous fringes. Because of these heavy tops the foliage is more spreading than is that of the typical form, and the habit is more bushy. The peculiar thread-like runners, or stolons, which form numerous young plants, hang down over the baskets in which the plants are generally grown, and add considerably to their ornamental value. A soil composed of fibrous peat and loam is the best, and the plants show off to the best advantage when grown in wire baskets suspended from the roof or ceiling.



Fig. 65.—Palm Cañon in San Jacinto Mountains.—See page 472.

the autumn. The leaves turn brilliant scarlet much later than those of the Japanese *Berberis Thunbergii* and are not affected by frost. This is one of the hardiest and most beautiful of all Barberries of the *vulgaris* type, and it deserves to be much better known in this country and in Europe than it is now.

SMILAX ROTUNDIFOLIA.—Another plant that deserves attention for the brilliant colors of its leaves late in the season

Cucumis as worthy of attention:

Cucumis dipsaceus, referred to on page 457, GARDEN AND FOREST, is an annual stemmed vine, growing, as your correspondent states, about six or seven feet high. The leaves are two and a half to four inches in diameter, rounded or oblong-reniform; stems, petioles and veins rough, with spiny hairs. The plant derives its specific name from the resemblance of the fruit to that of the genus *Dipascus* of an entirely different order. The pulp has an intensely bitter taste and probably

Cultural Department.

Notes on some Species of Cucumis.

AMONG many species of Cucurbitaceous climbers grown this past summer at the Botanic Garden, University of Pennsylvania, I would mention a few species of the genus

abounds in Cologynth, which property is common in a more or less degree to all the plants of this order. It is a native of Arabia, Upper Guinea and Nile-Land, and is described by Hooker in his *Flora of Tropical Africa*.

Cucumis odoratissimus, now generally regarded as a variety of *C. Melo*, is another interesting climber of this extensive genus, growing about seven or eight feet high. It is somewhat rougher in appearance than the preceding species. The fruit, which is frequently sold as a curiosity, is round, about one and a half to two and a half inches in diameter, chocolate colored and striped longitudinally with yellow and green bands. As its name implies, the fruit has a delightful odor, resembling that of a ripe pear.

Cucumis anguria, which climbs to a height of about ten feet, has smooth stems and leaves, the latter roundish-reniform, two and a half to four inches in diameter, and deeply three to seven lobed, the lobes serrate. The fruit varies from white globose to a prickly elongated shape, and is eaten cooked or pickled in the young and green stage by natives of warm climates. As to its native country, authorities vary; some claiming that it is of American origin, and it grows wild in Jamaica. Others claim that it is only a modified or cultivated form of some African species, either *C. Prophetarum* or *C. Figarei*.

Cucumis acutangula, now included under *Luffa*, is an extensive climber, stems and leaves smooth, the latter acutely five-lobed and deeply cordate at the base. The fruit is elongated and sharp-pointed, smooth, somewhat ten-ribbed. The origin of this species is not quite certain. It has been sent from various places in the West Indies and Central and South America, but indications point to its having been introduced into those places at some remote period. A bitter variety grows wild in British India, and it is said to be indigenous to the Sunda Islands. It has long been cultivated by the natives of Senegal.

Cucumis flexuosus, one of the Snake Gourds, said to be a variety of *C. Melo*. It has long green fruits, yellowish when ripe, which are thickened toward the apex. They are from one to two and a half feet long, variously curved or coiled (snake-like). They have the odor and taste of a cantaloupe. We let this species trail over the ground the past summer, although it might climb like the others if given support.

Botanic Garden, University of Pennsylvania. *Alexander MacElwee.*

Carnation Notes.

CARNATIONS and other flowers are to some extent neglected while Chrysanthemums are in season, and likely to be crowded aside to make room for the larger and more showy plants. But Chrysanthemums, which are all the rage for a month or six weeks, then disappear until another autumn, while the flowering season of Carnations is almost continuous, since carefully cultivated plants will bloom satisfactorily during eleven months of the year in benches or solid beds. The yearly improvement in Carnations is remarkable, and the high prices brought by good ones even during the height of the Chrysanthemum season are proof of their firm hold on public favor. Many persons prefer carnations to roses for table and house decoration, not because they are less costly, but because of their superior keeping qualities and their fragrance, which is more marked than it usually is in roses grown under glass.

The flowers of single-stem Chrysanthemums have now mostly been cut, and Carnations which have been carried over in pots in cold frames can be planted in their stead as soon as fresh compost can be got into the benches. Many growers carry over quite a number of plants in this way, and my personal experience is that it is a good method.

Plants should all be staked by this time; we prefer to do this work as soon as possible after they are housed. Of the many methods of staking Carnations now in use there is not one which gives general satisfaction. It is pleasant to note that the use of thick, clumsy-looking wooden stakes is on the decrease, and that wire supports of various kinds are taking their place. Different varieties of Carnations vary so much in vigor and habit that what suits one is of little use for another. The Worcester wire supports, manufactured at Worcester, Massachusetts, are now largely used in Massachusetts; for such varieties as Daybreak they are of no use whatever, and they are too weak to support a vigorous plant properly after the early spring months. We use galvanized wire rods, which are tied to an iron wire drawn along each row, and the beds have a neat appearance. The plants thus supported can always be readily loosened and cleaned, and if

they are properly tied the flowers can be quickly gathered. There are, no doubt, other methods superior to this in some respects, and we are alert to adopt any better system as soon as its greater advantages are proved.

The surface should be somewhat dry before water is given, and during dull dark weather this detail must have careful attention. At present our benches require two soakings a week—that is, more is necessary than a moistening of the surface soil. The amount of water required depends very much on the nature of the soil, sandy composts drying out most quickly. About the end of November we shall begin to give our plants weak liquid stimulants, or scatter a little chemical fertilizer between the rows and scratch the surface over before watering. Syringing on mornings of bright days is beneficial, and air should be freely admitted at every favorable opportunity. A little ventilation should be left on all night unless the outside air is very frosty. Our ventilators have not been closed any night up to this time. Green fly must be held in check by fumigation. Rust has shown itself to some extent on Bride of Erlescourt, one of last spring's introductions. The plants have been isolated and affected leaves picked off as they show. We are trying Bordeaux mixture, lime, fir-tree oil and other remedies. As a general rule, rust is less virulent now in this section than it was a year ago. Growers have discarded diseased stock and are taking greater precautions to ward off the disease.

Among the new varieties of 1895, Alaska is one of the best white sorts and promises to be a leading market variety. It is giving general satisfaction wherever it is grown. It is very floriferous, has a stiff wiry stem and finely formed flower of good size, with strong calyx. Lizzie McGowan has hitherto been the leading white variety here, and is looking well this season. The late Mr. Chitty's new variety is, however, likely to supersede it to a large extent. Crystal, a new white variety certificated by the Massachusetts Horticultural Society, makes wonderfully strong growth and throws very large flowers, lateral buds giving blooms as large as terminals. This variety was raised by Mr. Sewall Fisher, of Framingham, Massachusetts. With several growers it is not proving a free bloomer, but nothing could have been finer than a bunch of it in one of the Carnation-houses of Mr. William Nicholson, a neighbor of Mr. Fisher. At the same establishment were batches of two other promising white seedlings. Mrs. Fisher is still grown to some extent, but there is really no use for it with such a variety as Alaska on the market, though as an outdoor summer bloomer it is likely to continue popular. Meteor, the new crimson variety, one of Mr. Dorner's introductions, is somewhat like Portia in habit. The flowers are large, a brilliant crimson-scarlet, and are produced on stiff stems. It has not, thus far, produced many flowers, and they have mostly come semi-double. I question whether it will supersede F. Mangold. Rose Queen and Bridesmaid, introduced respectively by Messrs. Simmons and Dorner, have given but few flowers as yet here. As seen elsewhere they are not likely to approach William Scott in popularity. The last-named variety seems to outdistance all others of its color in good qualities, and is better this year than ever before. Nicholson is doing well with some growers, and its large, handsome flowers are in demand for wearing in buttonholes. Ada Byron seems to have been dropped altogether. Winter Cheer is at present giving us finer flowers than any other scarlet variety. As a pot-plant it can be highly commended. It does not, however, flower so freely and persistently as Hector and Portia. There is really not a satisfactory scarlet in cultivation—one that will compare with Alaska as a white or William Scott as a pink. Helen Keller, in stiff compost, at the warm end of the house, is giving better results than a year ago, and fewer flowers are fading when half-opened. Minnie Cook, a pretty fancy variety sent out by Mr. Chitty, is looking well where we have seen it, and is superior to Helen Keller in many respects. Daybreak and Thomas Cartledge—the one a delicate pink and the other a lovely carmine—should be in every collection. Both are fine growers and produce well-formed flowers on excellent stems. Among yellow grounds nothing new of value was yielded during the past season, and no generally free-flowering and satisfactory kind has yet been introduced of this color.

Taunton, Mass.

W. N. Craig.

Seasonable Notes on Roses.

THE latter part of the season of 1895 was too hot and dry for a good fall crop of roses, and few flowers were to be seen out-of-doors after the regular June crop was ended. This condition was naturally more noticeable in those gardens in which no facilities were provided for artificial watering, for, while

such watering will not produce the same results as a good rainfall, yet it will afford much help to the plants.

The value of good cultivation also becomes apparent in such a trying season, and mulching also proves its value in retarding evaporation. At this late date nearly all the work of the season is completed in the outdoor Rose garden, with the exception of protecting tender varieties against the sudden changes of our winters, and this operation is best postponed until winter begins in earnest. Plants covered too early are as liable to suffer as those not covered at all. The best winter covering for Roses has been the subject of discussion for many years, and practices widely dissimilar have been advocated, but it is agreed that a good mulching with long manure to protect the roots from frequent freezing and thawing, and a light covering of straw to protect the wood from sunshine and dry cold winds are most convenient and satisfactory. In the case of grafted plants, which are more often winter-killed than those on their own roots, the soil should be heaped up about the main stems, especially where the point of union between the stock and cion was not originally well buried.

With Roses under glass the critical season is just beginning, and careful management is required to keep both roots and tops flourishing. Mildew is likely to be troublesome now, unless great care is given to the ventilation; a cold draught is almost inevitably followed by such an attack. Sulphur painted on the heating pipes is a standard remedy, but it has the objection of bleaching the flowers to some extent. I have used a solution of sulphate of lime quite successfully, though its odor is unpleasant and might be decidedly objectionable in some private gardens. Grape dust is another preparation in favor with some large growers, and when applied carefully with a powder bellows is not very unsightly. Syringing, like watering, should now be done early in the day—that is, with a rising temperature in the house rather than with a falling one.

Well-established Roses will now be ready for a top-dressing of manure, but a light dressing often repeated usually gives greater satisfaction than a heavy one at longer intervals. The character of the soil has much to do with the amount and frequency of these applications, and though I have seen a magnificent crop of Jacqueminot Roses under glass, where fully four inches of strong manure had been used as a top-dressing, yet I should not like to recommend as much as this for general use. The plants referred to were exceptionally strong, and had been growing in the same beds for several years.

If early hybrid perpetuals are to be forced, the first crop should now be well under way. Anna de Diesbach and Mrs. John Laing are two of the best varieties for this purpose, and pot-grown or box-grown plants are easier to handle for the first crop than those planted out on benches. In fact, the box-grown plants are more convenient for forcing through the whole season on a small place, for a few plants may thus be brought in as required, and can be readily removed after the flowers are cut. Strong heat should not be used at first, but the temperature should gradually be raised until fifty-five degrees is reached by the time the shoots are well broken.

Holmesburg, Pa.

W. H. Taplin.

Notes from Baden-Baden.

SOME thirty years ago autumn-flowering Crocuses were a rarity, even in the best botanical establishments. Mr. George Maw collected, elucidated and figured these little floral beauties in his splendid work on this genus, and afterward liberally distributed living bulbs. Since that time they have become better appreciated, and those flowering in the fall were welcomed because they enliven our gardens at a time when flowers of this class are not common. Among the many species and varieties which have flowered here since August, I may specially mention *C. vallicola*, flowers white, with faint lines of a dark shade and yellow blotches in the throat. Some varieties flower in August; some are still in flower the last week of October. *C. pulchellus* is pretty, and freely produces its flowers of a color which might be called Crocus-blue. *C. longiflorus* is a charming species of robust constitution, having flowers of a very delicate lilac-purple. *C. sativus Taitii* is a variety discovered by Mr. Tait, of Oporto, in Portugal; the flowers are deeper in tint than those of the type. Close to this come *C. Cartwrightianus* and its variety *albus*. Both are close to *C. sativus*, but differ in color and shape; the dark red stamens on the lilac and white groundwork are a lovely combination. *C. iridiflorus majus* is also a very desirable species; it is nearly twice the size of the type; the inner segments are pale, the outer deep blue, with a tinge of purple; it is a beautiful variety and different in form from any other. The largest and most showy is *C. speciosus Aitchisoni*, originally found in Persia by Mr.

Aitchison, Surgeon-General of the English expeditions in Afghanistan. It is a very large, free-flowering variety, and shows to best advantage when planted closely. I must not forget the bright and deep purple-flowered *C. medius*, from the Mediterranean region.

Galanthus Olgæ Reginæ has been in flower since 15th September, and must be considered the earliest autumn-flowering Snowdrop, for, owing to adverse weather, it seems to be later than usual. *G. nivalis Octobrensis*, which has hitherto been considered the earliest, is just showing buds. *Kniphofia Nelsoni* is still full of flowers. Opinions differ as to its decorative value, but, in my estimation, it is the very loveliest of all Kniphofias as yet introduced. The elegant narrow spikes show different shades of bright scarlet more intensely colored than those of *K. Mackowani*.

Baden-Baden.

Max Leichtlin.

Correspondence.

Golden-rod Killing Horses.

To the Editor of GARDEN AND FOREST:

Sir,—An article under the above heading has appeared in several newspapers, and, perhaps, the presentation of the facts of the case may not be uninteresting to your readers.

During the past four years a large number of horses have died in the northern part of this state from the ravages of a disease which has baffled the skill of veterinarians, and I have been called upon to make investigations as to the cause and nature of the malady. At first it was thought to be anthrax, and samples of the blood and sections from the spleen and other internal organs were sent to the Bureau of Animal Industry and to Dr. Russell, of the State University, for bacteriological examination. Numerous bacteria were found, but the bacillus anthracis was not present.

The horses affected were in the majority of cases heavy draught horses from the lumber camps. These animals were brought from the woods in the spring, usually in good condition, and turned out to pasture. Most of them were fed grain while on pasture. On the farm of Mr. C. F. Reynolds, Hayward, Wisconsin, over seventy horses have died during the past four years from this peculiar malady. The pasture contained about four hundred acres, three hundred acres of which had been broken and seeded to Timothy. Adjoining this was one hundred acres of "slashings," or land from which the timber had been cut, but which had never been broken. This was thickly covered with Golden-rod. On one side of the farm is a lake with a clean gravel bottom and shore. The lake is fed by springs. There is no marsh or low land on the farm. Upon investigation I became convinced that the cause of the trouble was to be found either in the food or water, and watched the horses closely for several days, and saw them eating the Golden-rod greedily—some of them, especially those affected, seeming to prefer the plant to anything else.

I also visited the farm of Peter Truax, near Eau Claire. There is no Golden-rod to be found on this farm and the disease has not made its appearance. During the past summer Mr. Truax placed ten horses in pasture near by, where the plant was plentiful, and eight of them died during the summer and the remaining two are affected. When the healthy horses are taken from the pasture in the fall the disease disappears. None of the animals attacked by the malady have recovered, and medicinal treatment does not seem to produce any beneficial effect.

Symptoms: The animal appears dull, ears drooped, temperature elevated, ranging from 103° to 107°, Fahrenheit, during the entire course of the disease. The visible mucous membranes are pallid. On the mucous membranes of the vulva small petechial spots are seen. Occasionally the legs swell and edematous enlargements appear under the abdomen. The appetite remains fairly good during the entire course of the disease. Emaciation takes place rapidly as the disease advances. Loss of coördination with staggering gait. Death takes place in from two weeks to two months from the onset.

Post mortem: On cutting open the body the blood appears to be completely disintegrated, resembling ordinary blood serum. Intestines bloodless, with numerous petechial spots on the mucous membrane. Spleen enlarged, weighing from six to ten pounds. No structural changes apparent to the naked eye. The lungs and kidneys apparently normal. The brain and spinal cord were not examined.

I am fully convinced that this disease is due either to some poisonous principle in the plant or some parasitic fungus upon the surface of the same. It is now too late in the season

for any investigation to be carried on in this direction this year, but I intend to have the matter thoroughly investigated next summer.

Beaver Dam, Wis.

J. L. Scott.

[It would be interesting to know which one of the many species of *Solidago* is suspected of causing this disease; and whether horses are similarly affected in other sections of the country where this species grows in pasture lands.—Ed.]

Notes on the Western Apple Crop.

To the Editor of GARDEN AND FOREST:

Sir.—The following remarks apply especially to the upper sections of Kansas, but are, no doubt, more or less accurate for adjacent sections of Oklahoma, Nebraska and Missouri:

In the territory mentioned apples have become an important export crop within the last few years, so that there are numerous large orchards. Last spring, 1895, a very heavy crop was set, but the apples fell rapidly throughout the spring, and continued to fall until late in the summer, when the entire crop had disappeared from the trees. In order to reach a tolerably satisfactory explanation of these facts it is necessary to understand the attendant meteorological conditions. These were about as follows: A phenomenally severe drought prevailed during the fall of 1894, the following winter and the spring of 1895, and this was not broken till July 1st, at which time heavy and constant rains supervened. Moreover, this special season of drought had been preceded by two years in which hot winds and lack of rain had reduced the vitality of Apple-trees to much below their ordinary condition.

It is quite in accord with common experience that trees like these, debilitated and dying, and especially affected by drought, should manifest an unusual tendency to fruit-production. Following upon this it was not strange that weak and dying trees still unsupplied with water should be utterly unable to nourish the heavy fruit crop which they had set, and that many of the young apples should be dropped from the sheer inability of the tree to keep them growing. But it is not so evident why, after the hanging crop had been more than decimated, and after abundant rains had begun, the remaining fruits should continue to fall. On this point the following explanation is suggested: that the sudden supply of water to the trees set them to the production of new wood, and that the newly set up vegetative energies of the tree still further diminished the supply of nourishment at the disposal of the fruit by diverting it to foliage and wood-growth. This view of the case makes us able to refer it also to well-established horticultural principles. It is a good old maxim of the German botanists and gardeners that fruit-plants should be freely watered during the period when they set fruit, and that the water-supply should be gradually withheld with the later development of the crop. Exactly opposite conditions prevailed with this year's apple crop; and it is certain that some causes operated powerfully to the detriment of the fruit set, for almost the entire crop was dropped earlier than usual—that is, prematurely.

A severe frost which occurred on the 12th of May has been suggested by some as an additional cause of the trouble in question, but its responsibility in the case has not been verified, so far as I know.

Manhattan, Kansas.

F. A. Waugh.

The Lily Melpomene.

To the Editor of GARDEN AND FOREST:

Sir.—Mr. Allen has done well to call attention to the error that crept in in my notes on Lilies in a recent issue of GARDEN AND FOREST. He is quite right in stating that this Lily is not of hybrid origin, but merely a seed variation from *L. speciosum*. I had in mind when writing L. Parkmanni, and so the two were mixed mentally. Can any one tell where the true Melpomene of Hovey can be obtained? It does not seem to be in any lists which I have seen, and I have never known it but by repute. L. Parkmanni, I fear, we shall never see again in gardens; the whole stock was purchased from Parkman by an English firm, and I saw the whole stock with them this summer, and they assured me that it was impossible either to propagate it or make it grow in any situation, and it was dwindling away visibly, only a few remaining to mark the spot where it was planted. There seems to have been a preponderance of the blood of *L. auratum* in the hybrid, or, at any rate, it has inherited this fatal characteristic of that species, and the place that knew it will shortly know it no more. It is a pity that this, one of the reminders of a man of genius, should thus

perish, and so soon, but we are fortunate in having other plants, like the *Pyrus* and the *Poppy*, which bear his name.

South Lancaster, Mass.

E. O. Orpet.

Poison Sumach Once More.

To the Editor of GARDEN AND FOREST:

Sir.—To what you have published on *Rhus*-poisoning allow me to add that I recall, at least, three cases in which the affection occurred without renewed exposure, usually at a year's interval, but in the last case which has recently left our hospital, this being the fifth attack, only three months intervened. It is a curious fact that the same portion of the body—in the case above, the left arm—was invariably affected. It may be of some service to future victims to know that applications of spirits of turpentine made early, and, if possible, before vesication takes place, will relieve, if it does not wholly prevent, future suffering.

Fort Schuyler, N. Y.

Timothy E. Wilcox,
Surgeon, U. S. A.

Exhibitions.

The St. Louis Flower Show.

THE most beautiful flower show I have seen this fall was that held in the Entertainment Hall of the Exposition Building in St. Louis, beginning November 13th. The excellent general effect was due partly to the size and shape of the hall, but more still to the judicious and tasteful distribution of the exhibits. Specimen Chrysanthemum plants filled the dress circle, while displays for cut flowers were placed in the parquet and on the stage, in the rear of which were banked Begonias, Ferns, Palms, Araucarias and other specimen plants, entered in competition for the Shaw premiums. Pink Chrysanthemums were sufficiently in evidence to give variety to the prevailing white and yellow, but crimson colors were scarce, and of bronze blooms there were scarcely any worthy of note beyond a dozen flowers of Charles Davis and Bronze Giant. Mr. Hill's Louise D. Black, of an indescribable hue, was shown in admirable form. The only cut blooms of the holly type were two or three of L'Enfant des Deux Mondes.

The best specimen plant was an unnamed variety exhibited by Vaughan, of Chicago, and it took the premium for the best plant of any color. The same exhibitor took the first prize for the best white-flowered plant with a specimen of L. Channing, and Andrew Meyer, of St. Louis, took first prize for the best yellow-flowered and best pink-flowered plants, with fine bushes of Harry Sunderbruch and Viviand Morel. A fine specimen of Louis Boehmer, with flowers of first-rate color, was notable as the only example of this variety exhibited.

Of the cut flowers, Golden Wedding and The Queen were most successful, but Ivory, Minnie Wanamaker, Niveum, Mrs. Robert Craig and Mrs. Jerome Jones, among the white varieties, were conspicuously good. A new form of The Queen was exhibited by the Michel Plant and Bulb Company, of St. Louis, in which the centre of every flower was filled with a tuft of florets somewhat longer than the others, and similar tufts on different parts of the several flowers projecting beyond the evenly incurved outer petals gave them a distinct expression. Philadelphia, as here seen, did not make a good impression, on account of its undecided color, although it is beautiful and distinct in form. Flowers of Eugene Dailledouze were not quite up to the standard as to size, but this seemed owing to the fact that the blooms were not as far advanced as in former years; it is a great favorite here. Major Bonnaffon was as good as ever, and more even in size and development. Harry Sunderbruch, when well grown, maintains its good qualities, and by retail growers here is said to be the best market yellow. Challenge was seen to better advantage than heretofore, although a still later date would have helped it. A few fully blown flowers of this variety were a revelation of its possibilities, as the greenish centres were replaced by florets all of the same deep chrome-yellow as the body of the flowers and showing no trace of an eye. Viviand Morel was so abundantly exhibited that it practically seemed the only pink flower, and it was remarkably even in size and color.

A notable feature of the cut-flower show was an exhibition of fifty blooms on long stems. The colors were white and yellow, the varieties used being mainly The Queen and E. Dailledouze, with a few flowers of Mrs. Robert Craig and Pitcher & Manda at the base of the mass. With this exhibition, Messrs. W. J. & M. I. Vesey, of Fort Wayne, took the first prize in the class for growers. Other winners of first prizes for cut blooms were William Schray, St. Louis; Mr. Chalfant, of

Springfield, Missouri, and the St. Clair Floral Company, of Belleville, Illinois. A seedling named by the latter company St. Clair received a certificate. The flower is a ball-shaped Japanese, with long, narrow, rolled florets that stand out evenly and full so that it shows no eye. It is quite distinct in form, but as its color is not of the best its value for commercial purposes is questionable.

A unique collection from Santa Barbara, California, comprised thirty-seven plants, not yet introduced into cultivation, from Dr. E. F. Franceschi, well known to the botanists of Europe and America. They were entered for the Shaw medal for "a plant of decided merit for cultivation, not previously an article of North American commerce." Some of these are recommended by Dr. Franceschi as suitable for pot-culture and likely to become useful as florists' plants, and all of them may be counted upon to flourish in southern California and some of our southern states, so that the collection had a general interest besides its unquestioned botanical importance.

The following plants may be named as among the most interesting of the collection: *Albizia occidentalis*, an evergreen tree of elegant shape, with fragrant cream-colored flowers, interesting botanically as the only American species of the genus, which, until recently, was supposed to be confined to Africa and Asia. *Celosia floribunda*, a shrubby Cockscomb, which attains a height of six to nine feet, and is very showy while in bloom. The shining black seeds are used as food for canary birds. *Dendrocalamus membranaceus*, a giant Bamboo, from Burma, which is likely to be hardy in the south. *Lagerstroemia Flos Reginæ*, an Indian tree, which is there considered to be one of the most beautiful when in flower, the terminal panicles being two feet long, and the mauve-colored flowers three inches across. *Leptosyne gigantea*, a most remarkable composite from Santa Cruz Island, with a stout whitish trunk six to nine feet high, crowned with a dense head of feathery leaves and lateral umbels of large, bright yellow sweet-scented flowers. *Lyonothamnus floribundus*, an extraordinary tree never before introduced into cultivation, although it has been known for some time and is figured in Professor Sargent's *Silva of North America*. It attains a height of thirty to fifty feet and has a straight trunk; the young growth is covered with reddish hair and exhales an aromatic odor; the glossy evergreen leaves are finely cut and fern-like, and every branchlet is crowned with a terminal umbel of white flowers four to five inches across. Where this plant is not hardy it ought to be an elegant pot-plant. *Physalis glabra*, called in Lower California, of which it is a native, *Tomate oloroso*, the whole plant being musk-scented; it is of a bluish color and bears yellow flowers and red edible fruit. *Sapindus utilis*, a native of southern China, which has been cultivated in Algeria for its saponaceous qualities. It bears berries when it is only eight to ten years old, which are said to be very valuable for the amount of Saponine they contain.

Brighton, Ills.

F. W. S.

Palms in New York.

THE exhibition which occupied the Grand Central Palace in Lexington Avenue for the last ten days was an unusual one for this season, when the glare of the Chrysanthemum is in the ascendant. Mr. Manda's show was one where handsome specimens and decorative tropical plants were the leading features, with incidental collections of fine flowers as a secondary feature. This hall, while ample in its floor-space, does not lend itself to broad effects as does the lofty arena of the Madison Square Garden. On its spacious floor, however, Mr. Manda exhibited a very fine and, in fact, remarkable collection of plants, considering that they were drawn from his own stock. The arrangement of the main hall was in masses of plants in beds of varying design, with irregular paths between them, while in the side wings were various detailed specimens of plants, interesting on account of some eccentricity or some economic value. Such an arrangement has its advantages and its defects. Its advantage is that the casual stroller is impressed by the great masses of fine foliage and color; but the plant lover misses the individuality of the handsome plants which are necessarily confused in the massing. The most striking feature of the show was a number of very large specimen Palms, many of which were from the Baldwin collection in Philadelphia. One of the most striking of these was a *Chamærops gracilis*, about twelve feet high and in perfect condition, a most distinct and graceful Palm, with finely cut leaves. A spineless form of *Livistona Chinensis* was represented by two handsome specimens of about a dozen leaves each and of great spread, as this form has unusually long petioles, about twelve feet in this case. The *Cycas revoluta*, from the Tilden collection, was an old specimen with a trunk

six feet long and a head in perfect condition. This has acquired a local celebrity lately as having once been a possession of Washington. A most interesting plant was a specimen of *Cocos Weddelliana* in fruit. In spite of the great abundance of these plants one seldom sees an old specimen as large as this, about six feet high, in perfect condition, and it seems to seldom fruit in cultivation. There were also fine examples of *Pritchardia macrocarpa*, *Livistona rotundifolia*, *Phoenix reclinata*, *Sabal umbraculifera*, *Chamærops excelsa*, *Ceroxylon andicola*, the lower side of pinnæ silvery white, *Calamus calicarpus*, *Astrocaryum Mexicanum*, a very distinct Palm with a spiny stem. Such well-known plants as *Kentia Belmoreana*, *Pandanus utilis*, *Areca lutescens* were represented by superb specimens.

The masses of plants were composed variously either of Ferns, Crotons, Dracænas, Marantas, whose names are mostly familiar to fanciers of greenhouse plants, all in fine varieties and often in good specimens. Chrysanthemums were to be seen in specimen plants and single flowers, but the daintiest effect was found in a bank which masked the front of the stage, where, with a background of mirrors and among fine Ferns and much decorative foliage, were arranged many Orchids in bloom. Minute electric lights disposed throughout the mass helped the mirrors to give a reflection of the rear view of the plants, thus doubling the apparent depth of the group and more than doubling its effect. Here were choice Cypripediums, Zygopetalums, Oncidiums, Lælias and Dendrobiums in dainty array, all, perhaps, the more enjoyable in contrast with the masses of green to be seen in every other direction.

Recent Publications.

Agricultural Calendar for 1896. By F. W. Woll. New York: John Wiley & Sons.

This is an admirable reference-book for farmers, in which many of the essential facts relating to agriculture are arranged either in tables or in other convenient forms for reference. It contains the latest information in regard to feeding standards for various farm animals, with instructive notes on the characteristics of different breeds, the remedies for their common diseases and hints on their general care. All the ordinary facts about seeding and seed mixtures, the proper distances for planting vegetables and trees, with the average yields per acre of different crops, tables of noxious weeds, the most approved treatment for insects and fungi, rules for mixing and applying fertilizers, large numbers of statistics and general tables and concise treatment of such subjects as drainage, road-making, farm machinery, etc.—all this and much more are clearly and concisely set forth. The book closes with a directory in which the faculties and courses of study in the different agricultural colleges are given, a list of the experiment stations and their officers, the secretaries of the horticultural societies and other organizations, and a catalogue of the chief agricultural and horticultural papers. In fact, the book is full of just such information as any one interested in rural affairs needs, and it cannot but be helpful to every intelligent farmer or fruit-grower.

Notes.

Professor Marshall Ward has been chosen to fill the chair of botany in the University of Cambridge made vacant by the death of Professor Babbington.

Professor A. J. McClatchie, of the Throop Polytechnic Institute, has issued in separate form his *Flora of Pasadena and Vicinity*, first published in Reid's *History of Pasadena*. Unlike most American local floras, it enumerates the plants of the lower as well as of the higher orders.

Two weeks ago in these columns the beauty of the autumn foliage of our native *Leucothoë acuminata* was discussed. In the Arnold Arboretum last week some of the plants had lost their foliage, but on others the leaves were still green near the base of the stems, while on the upper part of the plant they were either bright scarlet or just turning from green to scarlet. A light fall of snow served to increase their beauty.

In semi-tropical spots, found all through the San Joaquin Valley, California, Lemons and Oranges flourish as well as in Southern California. The first shipment of oranges to San

Francisco this season came from Porterville, Tulare County, in the heart of this great valley. The orange season of Southern California is three or four weeks earlier than usual this year, owing to the effects of the hot north winds. The fruit promises to be unusually good in quality, and the yield one-third larger than it was last year.

String beans from Charleston have reached here frozen, and were, of course, unmarketable, but the cooler weather has generally stimulated the vegetable trade. Cucumbers are coming from Florida and sell for sixty cents a dozen at retail. Tomatoes from the same state cost twenty cents a pound; large, firm eggplants, the best seen here this season, can be had for fifteen to twenty cents each; new peppers bring fifty cents a dozen, peas \$1.50 a peck, and the last okra of the season eighty cents a hundred. Tomatoes are coming also from California in refrigerator cars. These are of superior quality, well ripened and heavy, and readily command thirty cents a pound at retail. Choice celery from Rochester costs \$1.00 for a dozen stalks, and New Jersey celery, in packages of four stalks, eighteen cents. Sweet potatoes, from Vineland, sell for thirty cents a half-peck; cauliflower, from Long Island, at twenty-five cents each; and Jerusalem artichokes, from New Jersey, at fifteen cents a quart. Cultivated mushrooms cost \$1.00 a pound, the season for the field crop having ended with the arrival of cold weather.

A few Easter Beurre pears were included in six car-loads of fruit received here from California last week, grapes comprising the main shipments. But, although the season for California fruits is almost ended, the wholesale auction-houses are even more busy now than during the summer months. At the sale of a cargo from Jamaica one day last week, 7,000 packages of fruit were sold in an hour and ten minutes, and \$30,000 changed hands. The same firm during the entire week disposed of 48,929 packages in auction sales, which occupied fourteen hours and a half, the sales aggregating nearly \$150,000. Jamaica oranges show a marked improvement in quality and condition, and prices have advanced \$2.00 a barrel. Other fruits coming from the same island now are tangerines, grape-fruit, shaddocks, many of which have a diameter of ten inches or more, and bananas. The highest-grade oranges have been selling for \$6.50 a barrel, wholesale; grape-fruit for \$8.50, and bananas for \$1.22½ a bunch. The Keuka Lake district is now supplying the best domestic grapes, and small baskets of Niagaras are still occasionally seen for twenty-five cents, Catawbas and Concords costing fifteen and twenty cents. Strawberries from California, of fairly good quality, sell for forty-five cents a box.

Mr. Charles W. Garfield is the editor of an interesting department in the *Michigan Cyclist* called the Road and Roadside. In a recent number of the paper Mr. Garfield makes a strong protest against the defacement of highways by advertising on fences and buildings, or on trees and other natural objects. He cites as an example a large rock by a wayside which had long served as a landmark and came to be an object of historical interest, while its striking form and the rich color of its lichens have given pleasure to all who passed it. In an hour the rock was scraped bare, and it was then covered with a blaze of pigments to celebrate some man's baking powder or pills or superior coffins. But, besides the defacement of natural objects at prominent points like street crossings, large signboards are now erected, on which space is sold to advertisers, and these uncouth creations are not only direct blemishes upon the landscape, but they shut out the beautiful effects of the scenery beyond them. Mr. Garfield writes of a beautiful turn in a highway about the bend of a small stream, where from one point an interesting view of the water-border, with its drooping shrubs and tracery of ferns, could be seen from the carriage. One day an immense sign was placed so as to directly hide this view. It was placed there simply because it was in the direction where people loved to look, and a maker of boots and shoes planted his business face where it was an insult to every lover of nature who passed that way. Certainly, this method of advertising is a flagrant abuse of the rights of the people who drive or walk over the country highways, since it deprives them of the quiet enjoyment of the natural beauty which is theirs by inheritance.

In the death of Calvert Vaux, who was accidentally drowned near this city last Wednesday, the profession of landscape art in this country has suffered an almost irreparable loss. Born in London almost seventy-one years ago, he had already achieved distinction in his profession as an architect, when at the age of twenty-four he accepted an invitation from Andrew

J. Downing to come to this country as his business associate. He had a talent for landscape-painting and an appreciative love of scenery, which enabled him to combine effectually natural objects and artificial structures. For several years the two artists were successful collaborators in the field of landscape art, and at the time of Downing's untimely death in 1854 they were engaged in designing and constructing the grounds about the Capitol and Smithsonian Institute, in Washington, the most important work of the kind which had yet been attempted in this country. Meanwhile, the gathering sentiment in favor of spacious and accessible city parks which had found expression in the eloquent letters of Downing at last secured, through legislative action, the purchase for a public pleasure-ground of the rectangular piece of land now known as Central Park. In 1858 the city authorities selected, out of thirty-three designs offered in competition for the new park, the one signed "Greensward," which was the joint work of Frederick Law Olmsted and Calvert Vaux, and Central Park as we know it to-day is the realization of this design in its essential features. This was the earliest example in this country of a public park conceived and treated as a consistent work of landscape art, and the first attempt in any country to plan a spacious pleasure-ground which should have the charm of simple natural scenery while it met the requirements of complete enclosure by a compactly built city. No one can read the original plan as presented for competition without feeling how thoroughly an experience of nearly forty years has justified the forethought of the young artists, or without a sense of gratitude to them that our first great park, which has to such an extent furnished a stimulus and a standard to other American cities for similar undertakings for all time to come, was a work of such simplicity, dignity, refinement and strength. It may be added that this "Greensward" plan, together with other reports on Central Park, on Morningside and Riverside Parks of this city, on parks in Brooklyn, Albany, Chicago, San Francisco and other cities, both in this country and the Dominion of Canada, by the same authors, contain a consistent body of doctrine relating to public pleasuregrounds, a systematic theory of park art with illustrative examples which is unique and invaluable. Mr. Vaux has been a member of many important commissions, and he acted as landscape adviser for the Niagara Falls Reservation, but for more than thirty years his best work and thought has been steadily given to this city, where, as landscape architect of the Department of Parks, he has designed many minor parks and squares as they have been acquired, and has completed the details of the larger ones. He had the genuine creative faculty which gave the stamp of originality to all his work, and a severity of taste which preserved it from anything like eccentricity or extravagance; and while thus fully equipped on the artistic side he had a fertility of resource and an unflagging industry which enabled him to grapple successfully with all the complicated practical problems of his profession.

In private life Mr. Vaux was a man of singular modesty, gentleness and sincerity, and while his learning and accomplishments gave him an assured position in the republic of letters and of art, his kindly and unselfish disposition endeared him to every one with whom he was closely associated. As a city official he was a model of intelligent zeal and sturdy integrity, and no man in public life was ever more loyal to his duty or to his art. More than once, when some construction affecting the design of the parks was undertaken against his advice, he promptly resigned, but in every instance he was quickly reinstated in obedience to a vigorous demand of the people of the city, who felt assured that while his counsel prevailed their pleasure-grounds were safe. To Calvert Vaux, more than to any other one man, this city owes a debt of gratitude for the fact that Central Park, in spite of attacks on every side, has been held so secure against harmful invasion and has been developed so strictly on the lines of its original artistic conception.

A cablegram received in Boston last week announced the death at Portsmouth, England, on the 18th instant, of Mr. C. L. Atkinson, who for many years had charge of Mr. John L. Gardner's estate in Brookline, Massachusetts, and was one of the best known and most skillful gardeners that America has seen. Not only was Mr. Atkinson a remarkably good gardener in all branches of the profession, but he was a genial, generous and intelligent man, full of interesting information about gardens and gardening in this country and in his native England, which in conversation he was always willing to impart in a picturesque, and often highly entertaining, manner. An honor to the profession, he will be missed and sincerely mourned by his friends and associates in the neighborhood of Boston.

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLES:—Mr. Vanderbilt's Forest.....	481
The Disappearance of Western Lakes	482
Notes on some Arborescent Willows of North America.—V....	M. S. Bebb. 482
FOREIGN CORRESPONDENCE:—London Letter.....	W. Watson. 483
NEW OR LITTLE-KNOWN PLANTS:—A Yellow-flowered Cosmos. (With figure.)	Professor J. N. Rose. 484
PLANT NOTES.....	484
CULTURAL DEPARTMENT:—Euphorbia (<i>Poinsettia</i>) pulcherrima.....	E. O. Orfet. 486
The Bertoloniias.....	N. J. Rose. 486
Vergennes and Moore's Diamond Grapes.....	L. H. B. 487
Hybrid Perpetual Roses, Japan Anemones.....	T. D. H. 487
CORRESPONDENCE:—Notes from Wellesley.....	T. D. H. 487
EXHIBITIONS:—Flowers at Madison Square Garden.....	488
RECENT PUBLICATIONS.....	488
NOTES.....	489
ILLUSTRATION:— <i>Cosmos sulphureus</i> , Fig. 66.....	489

Mr. Vanderbilt's Forest.

THE importance of preserving our forests has, for a long time, been an inviting theme for patriotic orators, and the necessity of scientific forest management as a factor in our national economy is at last recognized by every thoughtful man in the country. But a practical example is always more effective than any amount of preaching, and therefore we have already taken occasion to commend the experiment now in progress in Biltmore, the estate of Mr. George W. Vanderbilt, in North Carolina, as one which must prove of undoubted value to the future of this country. Indeed, it is the first experiment yet undertaken on this continent to restore to a profitable condition a considerable area of what was once forestland, but from which all the most valuable trees have been cut, while the comparatively worthless ones have been allowed to remain and propagate themselves, where the young growth has been preyed upon for years by browsing cattle, and the very fertility of the soil has been burnt out by frequent fires. It is the first instance, too, where a beginning has been made to manage a fairly good forest on scientific principles, and where an effort will be made to prove, for the first time in this country, that such a forest can be made to yield crops of steadily increasing value, while the land continually grows in productive capacity.

The Biltmore Forest proper embraces some five thousand acres of woodland, and the primary object of the management here is to improve the conditions of a forest lying on ridges and slopes which have been grazed and fired. A large part of it, when the operations began, was in as wretched and unpromising a condition as neglect and bad management could make it. The attempt to make it pay has therefore been made subordinate to the idea of improvement; that is, the scheme of work was devised in the first place for increasing the value and prosperity of the forest itself, and, therefore, in many cases the operations may not return more than the expenditure involved, and in some instances the returns may even fall short of that amount. Nevertheless, the expectation is that the work will be profitable, and if this is accomplished its value as an object-lesson will be

greatly enhanced. The Biltmore forest exists in the first place as a part of the estate, and, secondarily, as an example of forest management which will undoubtedly be useful, not only in this region, but wherever throughout the United States the results are made known. The conditions of the soil and of the trees where this work is going on are such that if success is gained here where good markets are remote, there is no reason why any and every large area of impoverished second-growth woodland in the country cannot be profitably managed.

Two years ago Mr. Gifford Pinchot, the forester in charge, gave an account of his treatment of this forest, and the results of the first year's work. We understand that since that time he has encountered no unforeseen discouragements, and his faith in the outcome is strengthened. Perhaps the most important result gained so far has been the demonstration that the expense of protecting the young growth in woodland operations is not as serious as Americans generally suppose. Of course, a healthy young crop of timber is the essential condition of good management, and unless this can be gained at a reasonable outlay there is no hope for future forests. It makes a great difference where a tract of woodland has been cut over whether a desolation or a thrifty forest of young trees is left behind; and Mr. Pinchot estimates that he can secure this vigorous young forest at an expense of not more than two or three per cent. of the total cost of removing the old timber. It seems to be entirely a question of training the wood-choppers, and, if this is true, the fact ought to be more widely known.

Pisgah Forest, a second part of the general experiment, is nearly contiguous to the Biltmore Forest, and comprises about 92,000 acres, or nearly 150 square miles of land, the greater proportion of which now bears virgin timber. It is good forest as forests average in that region, and some of it may be classed as very good. We have no space to give details of the work now prosecuted here, and, indeed, it would be premature to do so until there are actual figures to show. In a general way it may be stated that here, where there is already a stand of matured timber, the economic side of forest management will be illustrated on a large scale. Extensive operations in lumbering are now being carried on, and they will continue during the winter, and it is expected to prove on a commercial scale that lumbering will pay under systematic forest management, while at the same time the forest will steadily increase in value. It ought to be added that this Pisgah Forest, while it is essentially an economic experiment, is also an outing ground and game park of magnificent proportions, and if in all its phases it proves successful it will have a high educational value.

A third feature of Biltmore is the arboretum, which is expected to contain a collection of the trees and shrubs hardy in Biltmore, gathered from all over the world. Such a collection, even if it is not arranged or managed in the most rigidly scientific way, will be of great importance to all planters who can here see individuals and groups of trees and shrubs which are available for use in the northeastern United States. The dendrologist will here be enabled to study the entire forest flora of the north temperate regions of the earth, and the forester will find information as to the character and growth of important forest trees not elsewhere to be obtained. The usefulness of the arboretum will be greatly aided by the Forest Acres, a tract of some three hundred acres of land on which something like a hundred of the most valuable forest species which are hardy at Biltmore will be planted in forest form, so as to furnish information about their silvicultural character and needs, and, in the more important instances, it will show their quality in mixture with other trees. The arboretum as a whole will cover some eight hundred acres, and the collection proper will be distributed along both sides of a road twelve miles in length.

Taken altogether, this work at Biltmore is an unprecedented attempt, in this country at least, to gather informa-

tion which will be of use in forestry and illustrate its practical operation. There is no other place in the United States at present where practical forest management can be studied, and we are glad to know that Dr. Schenck, the resident forester, is already collecting around him a small body of American forest students. This is an appropriate beginning for a real forest school, and if it develops into the first fully equipped school of forestry in America it will be a natural and normal growth. Biltmore would be an ideal home for such an institution and for a forest experiment station, and a result like this would be a happy culmination of a broadly conceived and wisely conducted enterprise.

The Disappearance of Western Lakes.

NO T long ago, the St. Paul *Pioneer Press* published some reports from several counties in Minnesota and Dakota, in reference to the reduction of the lake area of that region. The map of Minnesota is dotted all over with these sheets of water. There were some seven thousand of them ten years ago, but probably one-third of those that were shown in the surveys at that time have disappeared, while the surface levels of those which remain have fallen several feet. Flax and wheat and grass are growing where fish were swimming a few years ago; lakes have degenerated into mud-holes, and the larger ones have shrunk in area and decreased in depth from four to eight feet. This remarkable change in the surface of the country is one of which the people in the east have heard comparatively little; and in reply to inquiries on the subject we have received interesting letters from the experiment stations of North Dakota and Minnesota which verify the facts and give a few of the theories which have been used to account for them.

Professor Green, of the Minnesota station, writes, that where for several years crops have been growing on these former lake beds, the question as to the title to the land of those who now till them, and who originally purchased farms on their shores, is a question of much controversy. The reason generally assigned for the phenomenon is that since the contiguous prairie land has been broken up, a great proportion of the rainfall soaks into the ground instead of running off into the lake basins. Professor Waldron, of North Dakota, after citing this theory, adds that many lakes which are still surrounded by original prairie sod that has never been broken by the plow nor disturbed by pasturage, have shrunk to the same extent as the lakes in the tilled area. This, however, does not prove the theory incorrect, from the fact that as the lakes in the tilled area gradually dry up the natural water-table sinks from year to year, and the effect of this is seen upon all other lakes, including those surrounded by unbroken prairie. Devil's Lake, which is fifty miles long, has fallen eight feet in twelve years. Professor Waldron suggests that there might be some geological causes for this special case, but the fact that all the lakes over the eastern part of North Dakota, some of them two hundred miles from Devil's Lake and on different water-sheds, are passing through the same change, and that the rivers are also much smaller than they were ten years ago, would seem to indicate some general cause which operates throughout the whole area.

Another explanation offered is that a series of wet seasons tends to fill up the land depressions, while a series of dry years has the opposite effect. But, so far as the records for twenty years show, there is no such alternating series of wet and dry seasons. If any three seasons taken together are compared with any other three seasons, the difference in the total rainfall for the two periods is less than half an inch, while the rainfall of no single year has fallen more than two inches below the average, or has ever been more than two inches in excess of the average. The distribution of the rainfall as to the seasons of the year has a marked temporary influence on the amount of water in

lakes and shallow sloughs. Five years ago a large slough adjoining the city of Fargo was left entirely dry after a dry spring and summer, and it remained dry until the next year, when heavy autumn rains filled it to an average depth of five or six feet, and the water thus accumulated remained comparatively constant for three years, when the slough was dried up by draining. The rainfall during these three years had not been perceptibly heavier than it was during the three previous years, but larger quantities fell during a short period in the spring and fall, and if the same amount of precipitation had been distributed over longer periods the adjoining lands would have absorbed more, leaving the slough comparatively dry. This explanation, however, will not account for the condition of lakes that were ten years ago constantly full of water and have been gradually becoming drier and drier, until crops are now grown in their basins every year.

There seems to be no doubt that there have been periods in former times when the lakes were dry or the water in them very low, after which they filled up again and remained so for a long time. Whether this region is passing through one of these periods of low levels now, which is to be followed by a higher lake-level in a few years, no one knows, but it is not improbable that the increased tillage of prairies and the cutting away and the burning of the woods will operate against a recurrence of the high-water level. The subject is certainly one of great interest, and in the absence of accurate meteorological data, which extend back for a long period of years, it has been difficult, so far, to find any solution of the question which is altogether satisfactory.

Notes on some Arborescent Willows of North America.—V.

SALIX PIPERI, n. sp. [§ *LANATÆ*.]—Twigs stout, very smooth, dark brown; leaves elliptical-oblong, obovate or oblanceolate, one and a half to two inches wide, four to six inches long, acute, glabrous, dark green above, glaucous beneath, irregularly undulate-crenate or nearly entire; petioles slender, one-half to three-quarter inches long; stipules none; buds large, smooth, chestnut-brown; male aments sessile, thick, one to one and a half inches long, copiously silky with straight white hairs as long as the filaments; filaments united at base or free; female aments more slender, less silky, shortly peduncled; scales obovate or orbicular; capsule ovate-lanceolate, smooth; pedicel three times the length of the gland; style as long as the pedicel; stigmas bifid, entire. Seattle, Washington, Professor Charles V. Piper, Nos. 558, 560. Named for the discoverer, who has made a most thorough exploration of the rich Willow flora of Puget Sound. Professor Piper sends the following field-note:

During the several seasons that I was especially interested in the collection of Willows, I found, near Seattle, only three plants, with one or two at other points. Two of these, staminate, grew, one in a swamp near Lake Union, the other not far distant in a Sphagnum-bog on high ground. Both had several stems rising from the same root eighteen to twenty feet high, not much branched till near the top; branchlets dark-colored and smooth. The one pistillate plant grew at the edge of Lake Washington, three miles from the staminate mentioned above, in the old gravel beach of the lake. This also had several stems, three to four inches in diameter, with a smooth dark grayish bark, sparingly branched; branches erect. Owing to its extreme isolation the aments were very imperfectly fertilized—perhaps by the pollen of *Salix Scouleriana*, which grew in the vicinity and flowered at the same time.

A most notable contribution to the known Willows of North America was made in the *Flora Boreali-Americana* when three new species of the *Lanatae* group were described, a full-plate illustration being accorded to each. Of these *Salix Richardsonii*, of high northern distribution, is a close geographical equivalent of *S. lanata*, which, Wahlgren says, is "easily the most beautiful Willow in Sweden, if not of the whole world." The other two—*S. Barrattiana*, occurring rarely in the Rocky Mountains just north of the

United States boundary, and *S. Hookeriana*, common on our north-west coast from Oregon to British Columbia—are more distinctively American types. To the last mentioned the present species is most nearly allied, but differs conspicuously in the entire absence of that grayish pubescence of both leaves and twigs so characteristic of *S. Hookeriana*. The leaves in one form are similar in outline, in others much narrower, with a very irregular repand margin. The beautiful silky aments are like those of *S. Hookeriana*. The filaments, occasionally united at base, is a marked characteristic of *S. lasiolepis*, and it is not improbable that *S. Piperi* will be found to vary in the direction of that species. It seems, in fact, to combine the characteristics of these two very dissimilar species, *Hookeriana* and *Lasiolepis*, while abundantly distinguished from both.

Rockford, Ill.

M. S. Bebb.

Foreign Correspondence.

London Letter.

LUDDEMANIA TRILOBA.—This is a new species which has lately flowered in the collection of Sir Trevor Lawrence, who exhibited it this week at the meeting of the Royal Horticultural Society and obtained for it a first-class certificate. It has the habit, pseudo-bulbs and foliage of an *Acenita* and *Pescatorea*, to which the genus is nearly allied, and produces a pendulous raceme about two feet long, bearing over thirty flowers one and a half inches across, of waxy appearance and colored bright yellow, tinged with brown; the lip is three-lobed, yellow, with a blotch of purple. It is a native of the Peruvian Andes. Considerable interest in the plant was evinced by Orchid fanciers, as it possesses attractions in the size and color of its flowers, and also in their strong aromatic odor. No doubt, Mr. Lehmann, who is said to be the discoverer of this new species, knows where plenty more are to be had. The genus is scarcely known in English collections, although special attention was called to it by the late Professor Reichenbach at the Orchid Conference held at South Kensington a dozen years ago, and more recently by a figure of *Luddemania Pescatorei*, hitherto the only known species, published in *The Botanical Magazine*, t. 7123, prepared from a plant flowered in the Botanic Garden Glasnevin in 1889. This has large egg-shaped pseudo-bulbs, plaited leaves three inches wide, and a pendulous scape three feet long, bearing about fifty yellow and brown flowers. It is a native of Ocana, Colombia, at an elevation of 6,000 to 9,000 feet.

LÆLIO-CATTLEYA CALLISTOGLOSSA, var. *IGNESCENS*.—This is a ludicrous name for a beautiful new hybrid of Veitchian production, which obtained a first-class certificate on Tuesday last. Its parents are *Cattleya Gigas* and *Lælia purpurea*, and it differs from the type, which Reichenbach described in 1882 as *L. callistoglossa*, in having a brighter colored lip—a difference due to the use of a larger, richer-colored variety of the *Cattleya* for the later cross. *L. callistoglossa* is still one of the best of the hybrid *Cattleyas* or *Lælias*, the large, well-formed flower and magnificence of the lip being scarcely equaled.

CYPRIPELUM COUNTESS OF SALISBURY, a new hybrid between *Cypripedium bellatum* and *C. barbatum superbium*, was shown on Tuesday by Messrs. F. Sander & Co., and received a first-class certificate on account of the rich coloration of the flowers, the large drooping petals and dorsal sepal being white, with dark brown spots suffused and lined with rose-purple, the pouch being dull brown flushed with rose. There are several other hybrid *Cypripediums* from the same parent species, but this is distinct from and superior to them all.

CATTLEYA GIGAS (LABIATA WARSCEWICZII).—Several thousands of newly imported plants of this, one of the noblest of all *Cattleyas*, have been sold at auction in London this week, and I believe there are many thousands more to come. The prices realized were exceptionally high, owing to brisk competition, a proof of the high opinion Orchid

specialists have of its merits. I never saw a variety of this *Cattleya* that was worthless. Some of the forms have been named *Sanderiana*, *imperialis*, etc. The introduction of a large quantity of it in 1870 by the collector Roezl first brought it into popular favor, although it had previously been sparingly represented here from the time of its discovery by Warscewicz in Medellin, Colombia, in 1848. Messrs. Sander & Co. have evidently found a locality where this plant is abundant, and their collector states that he saw many magnificent varieties in flower, and that they flower there twice a year. In cultivation here they flower in July or August, but they often fail to flower at all through being grown in too much shade, this *Cattleya* preferring plenty of sunlight at all times.

VANILLA.—An exhaustive historical and descriptive account of the species of *Vanilla* known to yield aromatic fruits of commercial value has been prepared by Mr. Rolfe, and published in the *Kew Bulletin* (1895, pp. 169–178). This paper is of interest, as it shows the relative commercial positions of the species and makes clear their nomenclature, hitherto much confused. Six species are admitted as being of more or less commercial value; they are *V. planifolia (aromatica)*, the most important and widely cultivated in the tropics; *V. Pompona*, which yields the vanilles of Guadeloupe; *V. Gardneri*, the source of Brazilian or Bahia vanilla; *V. phæantha*, cultivated in Jamaica and Trinidad, and *V. appendiculata* and *V. odorata*, which do not appear to have as yet any commercial importance, though they produce aromatic fruits. *Vanilla* is said to have been brought to England as a perfume about the year 1510, at the same time as indigo, cochineal and cacao, and ten years earlier than tobacco. An article on the cultivation of the plants, the fertilization of the flowers and curing of the fruits was published in the *Kew Bulletin* in 1888. Mr. Rolfe has also prepared a monograph of the species of *Vanilla*, which will be published in the journal of the Linnaean Society. He admits no less than fifty species, or more than twice as many as were known to Bentham when the *Genera Plantarum* was published twelve years ago, where the genus is said to comprise twenty species.

BEGONIA MRS. I. HEAL.—This is another valuable addition to the winter-flowering Begonias obtained by crossing *B. Socotrana* with the tuberous-rooted kinds. It has lately been raised by Mr. Heal, of Messrs. J. Veitch & Sons, who consider it the best of all the *Socotrana* hybrids. The leaves are five inches across, fleshy, dark green; the scapes are short and axillary, and the flowers, which are in loose clusters, are each from two to three inches across, of good substance and colored bright crimson. It resembles *B. Socotrana* in producing chiefly male flowers and in their remaining fresh on the plant a long time. Messrs. Veitch obtained a first-class certificate for it a month ago. *B. Socotrana* is now in flower at Kew.

SAINTPAULIA IONANTHA.—When well grown this is one of the most charming little warm-house plants. Seeds sown in February and treated as for *Gloxinia*s will produce plants which by the end of September should be a foot across, crowded with healthy leaves and flower-racemes which should continue to develop flowers all through the winter. Plants in four-inch pots bear about twenty expanded flowers at once. It is as useful and pleasing for indoor gardening as the Pyrenean *Ramondia* is for the rock-garden. It is totally unlike any other garden-plant introduced from Africa, and were it not known to be truly native of central Africa we should guess it to be of Chinese origin.

SUBSTITUTES FOR LARCH.—Hitherto the European Larch has been the staple plantation tree in this country, its poles having various uses for scaffolding, etc. In recent years, however, it has suffered severely from a canker fungus (*Dasyscypha Willkommii*), and planters are in consequence looking out for promising substitutes. Dr. Masters came to their aid this week with a lecture before the Royal Horticultural Society on the most likely conifers to take the place of Larch as a plantation tree. He recommended the Corsican Pine as the best of all, the Douglas Fir as a good

second, but warned planters against using it for exposed positions. Menzies Spruce and Redwood he also considered well adapted for coppice wood. *Abies brachyphylla*, from Japan, was also spoken of as a promising tree. At Kew this is, perhaps, the quickest grower and most satisfactory of all Firs. Dr. Masters called special attention to the merits of *Cupressus macrocarpa* as a tree for situations near the sea, where it thrives amazingly.

London.

W. Watson.

New or Little-known Plants.

A Yellow-flowered Cosmos.

THE announcement in a recent number of *GARDEN AND FOREST* (page 426) that *Cosmos sulphureus** would probably be on the market next season will be welcome news to those who are at all familiar with it. I have had the plant in cultivation in my own garden and in the greenhouses of the Department of Agriculture since 1892. It promises to be a most desirable acquisition to our list of late-flowering annuals. This plant was described and figured by Cavanilles and Jacquin about the same time, one describing it as *C. sulphureus*, the other as *Coreopsis artemisiæfolia*. The former found the plant in cultivation in the Royal Gardens at Madrid. The plant has been collected from time to time by Mexican collectors, including Coulter, Leibmann, Andrieux, Galleotti and Pringle, but it seems not to have got into cultivation. The plant has been very rare in herbaria. The National Herbarium did not possess a specimen until it was brought from the state of Jalisco in 1886 by the veteran collector, Dr. Edward Palmer. Since then Dr. Palmer has repeatedly sent us specimens from Colima, Tepic and Culiacan, in western Mexico. Mr. E. W. Nelson has also sent specimens from various places in the state of Oaxaca. Our plants in Washington have always attracted much attention when in bloom, and if grown in beds would make a most gorgeous display. Our chief objection to the plant in this latitude has been its very late time of flowering, none of our plants having ever bloomed before the first of November. Several hundred fine specimens growing in the Department grounds were killed by frost the latter part of October. This species will not stand as much cold as the common cultivated species. It is stated in the article referred to above that the plants begin to flower in midsummer, but I doubt if this is the case with seed sown out-of-doors. If the seed is started in cold frames or in the greenhouse early-flowering specimens may be obtained. Plants when placed under glass late in the fall soon begin to bloom and continue to send out flowers for several months. The plant itself is not at all attractive, but resembles a rank weed, not unlike the common Ragweed, *Ambrosia artemisiæfolia*. It grows from four to seven feet in height, often much branched, especially at the top. The leaves are large, often a foot or more long and two to three times pinnate. The flowers, which are produced in great abundance, are borne on long naked peduncles seven to ten inches in length, are generally of a dark orange color, and are from two to three inches in diameter. The plant is easily cultivated. In the wild state it is found along creek-bottoms, and would naturally require a rich soil. Introducers of this species must be careful to obtain pure seed. Attention has already been called in *GARDEN AND FOREST* to *Bidens ferulæfolia* being sold for *Cosmos sulphureus*. I have recently seen

specimens from London of a *Bidens*, presumably the above, which were grown for this yellow *Cosmos*. There ought not to be any confusion with regard to these plants, as they can easily be distinguished by their seeds. The *Bidens* has a small seed, two lines long, somewhat flattened, with two short awns. The *Cosmos* has a long slender seed nearly an inch long, including the slender beak, with two slender awns.

An illustration of this species, drawn from living specimens by Mr. C. E. Faxon, appears on page 485. Since the above was written I have received specimens for Mr. H. L. T. Wolcott, from New Orleans, where the plant grows abundantly and luxuriantly.

J. N. Rose.

Washington, D. C.

Plant Notes.

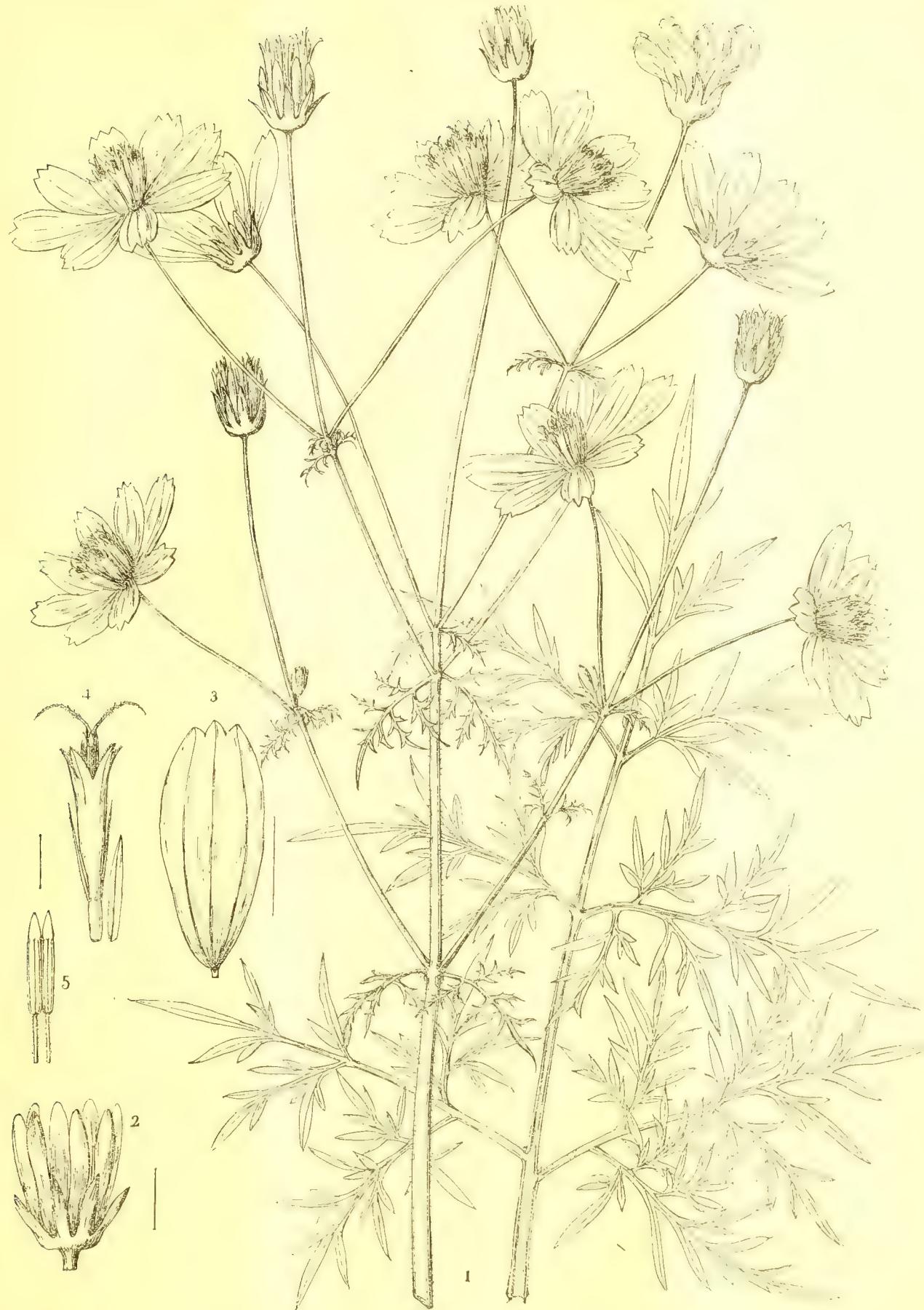
ERCIS CANADENSIS.—The American Red Bud is not a specially noteworthy tree for the autumn colors of its foliage, although the leaves turn rather early in the season to a clear bright yellow. It is, however, one of our many small trees which are first-rate for ornamental planting. It is common throughout the region south of the Delaware River valley, in New Jersey, in the east, and in Missouri in the west, and on swamp borders and bottom-lands, especially in regions west of the Alleghanies, and it is abundant in all our forests. The flowers, which appear in early spring with deep red calyxes and rose-pink petals, cover the branches in crowded clusters just as the leaves begin to appear, so that in places where the tree is abundant the landscape is fairly illuminated by them. The abundant legumes attain their full size in this section before midsummer, and are then of pink color and somewhat ornamental, and the broad ovate leaves are light and cheerful. When allowed to develop, the tree becomes a broad flat-topped specimen, which is interesting and beautiful at all seasons of the year. It is perfectly hardy considerably to the north of the region where it is found in a wild state. The so-called Japanese Red Bud, which is really of Chinese origin, is here a large shrub, which produces more richly colored flowers than either of the American species or the European Judas-tree, and when in flower in early spring it is an attractive shrub, while its glossy leaves make it an interesting plant all summer long. It is not reliably hardy much farther north than this city. We have already described and figured this plant in vol. v., page 476.

VIBURNUM LANTANA.—The European Wayfaring-tree must be commended for its habit of carrying its leaves late into the autumn. Two weeks ago, in the neighborhood of Boston, after the hard freeze of Wednesday night, it was covered with leaves, many of them almost as fresh as in midsummer, while the upper surface of others, especially near the top of stems, had assumed a rich dark purple color, which formed a delightful contrast with the green of their lower surface. The Wayfaring-tree has often been recommended in the columns of this journal to American planters. It is one of the hardiest and most vigorous of the European shrubs that have been planted in this country; its habit is excellent; the foliage is ample, dark-colored and luxuriant; its large flat clusters of pale yellow flowers are produced in profusion, and these are followed by berries which in ripening turn irregularly from green to scarlet and then to blue-black, and often do not fall until the beginning of winter.

VACCINIUM CORYMBOSUM.—The season ought not to pass without some mention of the striking autumn colors of the High Blueberry. It is not often cultivated in this country, although in Europe it is grown to a considerable extent. It ought to be more generally planted, for it is beautiful at all seasons and it is not difficult to transplant, either from its native swamps or hillsides, and it will grow in almost any good garden soil. In rich swamp borders it is a shrub from six to eight feet high, with stems two or three inches in diameter. In open fields and by the wayside it does not grow more than from two to four feet high, but wher-

* *Cosmos sulphureus*, Cavanilles, *IC.*, i., 56, t. 79 (1791); Gray, *Proc. Am. Acad.*, xxii, 429; Rose, *Contrib. Nat. Herb.*, i., 336.

Coreopsis artemisiæfolia, Jacquin, *IC. Rar.*, 595; *Col. Supl.*, 155 (1796). Annual, four to seven feet high, much branched, pubescent; leaves bi- to tri-pinnatifid, often twelve inches or more long, with rachis and midrib hispid; pinnae alternate, entire or two to three toothed; peduncles seven to ten inches long, naked; outer involucral bracts eight, linear, acuminate, green, two lines long; inner bracts eight, oblong, obtuse, scarious, five lines long; flowers two to three inches broad, from a light to dark orange color; rays eight, broadly obovate, three-toothed at apex, strongly ribbed beneath, standing at right angles to the axis; disk-flower in a compact erect cylinder, four to five lines long; proper tube one line long; throat funnel-form, three lines long; lobes pubescent along the margins; anthers exerted, black, with orangetips; filament pubescent; style branched with long slender tips; akenes linear, ten to twelve lines long, including the slender beak; pappus of two awns two and a half lines long, slightly retrorsely hispid.

Fig. 66.—*Cosmos sulphureus*.—See page 484.

1. Upper portion of a plant with a lower leaf, natural size. 2. An involucre, enlarged. 3. A ray flower, enlarged. 4. A disk flower, enlarged. 5. Two stamens, enlarged.

ever it is seen in late October its leaves are a brilliant scarlet, and they remain highly colored for a month. In late spring and early summer its large white bell-shaped

flowers are very ornamental, while its abundant fruit is not only beautiful, but pleasant and wholesome. It is very variable in the size and quality of its berries, which are

considerably larger in some individuals than in others, so that it is a promising plant for experiment in the direction of improving its fruit. Plants with black fruit and others without the blue bloom are often seen.

THE REINWARDTIAS.—These are fine, old-fashioned East Indian mountain plants, belonging to the Flax family, of a dwarf shrubby habit and producing a wealth of yellow flowers. *Reinwardtia (Linum) trigyna* is the best of the species commonly grown. The leaves are alternate, small, ovate-oblong, entire, with a mucronate apex and a smooth glaucous green surface. The flowers are two inches across, bright orange-yellow, solitary or in small clusters from the axils of the upper leaves and very numerous. The delicate petals are spreading and connate at the base. This beautiful winter-flowering greenhouse plant is easily increased by means of half-ripe cuttings from the tips of the shoots. They can be rooted in a slight bottom-heat in the ordinary way. *R. tetraptera*, although not as showy as the first named species, is one of our best plants for the parlor and window and home culture generally. Although quite as dwarf as *R. trigyna*, it is a coarser plant and, if possible, it is easier to propagate. It has rather long, broadly lanceolate acuminate leaves with well-marked veins and coarsely crenate. The stem is stout and erect, and the pale yellow flowers are produced in few-flowered fascicles or singly from the axils of the leaves. These are rather smaller than those of *R. trigyna*, but equally numerous. Both species are low-growing, dwarf plants, and they form compact, bushy specimens if the young plants are frequently pinched during the summer. Although the petals of these Reinwardtias are fugacious, the flowers are produced in such abundant succession that both of them make a good show for five or six weeks in midwinter when yellow flowers are scarce.

MEYENIA ERECTA ALBA.—In a recent number of this journal reference was made to the beautiful Meyenia erecta, a small shrubby plant nearly related to the Thunbergias. This species forms dwarf, bushy specimens and bears almost continually flowers of a deep violet-blue. The variety alba is as yet a rare plant, with almost pure white flowers, but they have a faint tint of purple in the tube, and the throat is a rich orange. In size and shape they do not differ from those of the species. On account of the color this beautiful variety is even more valuable and effective than the parent form and will prove an interesting addition to the list of plants for conservatory and house culture. The Meyenia begins flowering while quite small, almost as soon as the cuttings are well rooted and established in pots.

Cultural Department.

Euphorbia (Poinsettia) pulcherrima.

THIS beautiful Mexican shrub is well known as one of the best decorative plants for winter use, especially at this season when there is a dearth of bright color after the Chrysanthemums are gone. The old name is the one by which the plant is generally known in gardens, and since it has become fast-rooted in garden literature Poinsettia will continue to be the common name of the plant.

In Mexico, of which country this Euphorbia is a native, it forms huge bushes or shrubs that are a mass of brilliant color at the festive season, and so also in Florida, where it is cultivated frequently. After a frost such as they experienced last winter, the plants are killed down to the ground, although they generally spring up again with returning warmth. There are two well-marked varieties of the Poinsettia that are cultivated; one has white bracts with a suffusion of green and is useful by contrast with the type, and the other is called the double form, owing to its having a double row of scarlet bracts instead of the single whorl. Both of these are more delicate in constitution than the parent, and are more liable to lose the lower leaves when approaching the flowering period, and this detracts from their value as decorative plants. We usually manage to have Poinsettias in full bloom at Thanksgiving time every year, and from then onward until after New Year we have a bright show of color for house decoration, for the dinner-table or for vases. Complaints are often heard that the

bracts do not last after they are cut from the plants; this is due to the loss of sap and can be easily remedied by having a pail of boiling water ready when they are cut in which to steep the cut parts immediately and before the loss of sap takes place. Searing the cut with a hot iron acts in the same way, but we use hot water, an old plan not so well known as it should be. For church decoration these plants are very effective and appropriate at the holiday season, but florists do not care to use them if they do not keep fresh.

After the flowers are cut the plants must be kept dry for the rest of the winter, and when there are signs of returning growth in May or June they may be cut down close to the soil, leaving only a joint or two, and these will soon start. They may then be repotted and kept outdoors all summer until cool nights arrive at the end of August. They are very sensitive to cold, and will show the effects of a cool night more quickly than almost any other plant; hence the necessity of getting them under cover first of all plants, giving them an airy house at first to prevent a weak growth, and when the heads of bracts show, an occasional watering with some stimulant will greatly help to develop large heads. We have had them twenty-two inches across, but when as large as this they are not effective for general decorative uses.

Poinsettias are easily propagated by making hardwood cuttings of two or three joints of the ripened wood and placing them in sand; these are preferable to cuttings made from soft, succulent shoots, though even the young shoots root freely if taken off after the plants have been exposed to the sun and air outdoors from the time they showed signs of starting into growth. A good heavy loamy soil is best for them at every stage of growth, and they will thrive well in one that suits Roses. Care should be taken to secure perfect drainage in the pots.

South Lancaster, Mass.

E. O. Orpet.

The Bertolonias.

FEW plants offer a more remarkable combination of colors in the foliage than the small but interesting genus, Bertolina. It belongs to the natural order Melastomaceæ, and, as generally understood in gardens, includes the closely related genus Gravesia. These are all dwarf-growing, erect or creeping herbs, with opposite leaves and axillary or terminal cymes of showy flowers, mostly pubescent or hispid foliage and smooth stems and peduncles. They are natives of South America, chiefly Brazilian, growing in deep shade in decaying vegetable matter. They naturally love a close and moist atmosphere.

A number of garden hybrids and varieties have been raised, some common, others exceedingly rare, in cultivation. The rather common and very beautiful Bertolina Van Houttei is understood to be a garden hybrid. The foliage is ovate, elliptic, or ovate-lanceolate, mostly with cordate base and obtuse apex, sometimes acute, or even acuminate; it is generally marked with lines or spots of a startling bright and pure color. The flowers are showy, white, rose or lilac, and open in the morning only and during dull weather, but are produced almost continually by well-grown plants. Petals five, ovate or elliptical, acute or obtuse, with a short claw; sepals acicular, mostly glandular and hairy. Stamens yellow or white. The inflorescence is an umbellate or corymbose cyme, borne on single or branched peduncles, above the foliage.

The Bertolonias are not common in cultivation; in fact, they belong to a class of plants that will always remain rare, although easily grown when the proper method of cultivation is understood. They should be grown in a moist stove or under bell-glasses in almost any warm greenhouse, where they can be shaded from the strong sun. Fibrous peat and sphagnum moss, chopped and mixed with some dry cow-manure, is the most satisfactory compost. The plants will grow in any light soil, but the above mixture is preferable to any other. Propagation by means of cuttings is simple and easy. The cuttings should be inserted singly in two-inch pots and plunged in moderate bottom-heat under a bell-glass. Young leaves may also be used for reproduction and should be inserted in sand in the same way as cuttings of Begonia leaves, but under a bell-glass. Small plants will form in time at the base of the principal veins, but the process is slow and only to be recommended for very rare kinds.

All the varieties are easily raised from seed, and this is the most satisfactory method of propagation. Seed should be sown in a compost soil of moist peat and sand, covered with glass and kept moderately warm and shady. Hybridization is very easy, and new distinct varieties may thus be raised by any intelligent gardener. The real origin of many of the garden forms is not very clear; probably they connect the two genera, as Gravesias have always been known to horticultur-

ists under the name of Bertolonia, and it is likely that hybrids have been raised between the two. The nomenclature is much confused, and many species and varieties are named in commercial plant-lists. A few of the most desirable are here-with given:

Bertolonia ænea: Leaves, when young, coppery; when older of a bronzy, metallic lustre; dull violet-purple below; petioles as long as the blade (three to five inches), red; flowers pale rosy-lilac, opening during early morning and in dull weather, three-fourths of an inch across, pleasing. Leaves crowded and spreading; height of plant, six to ten inches. *B. (Gravesia) guttata*: Leaves ovate, four to six inches long, deep lustrous green, with longitudinal rows of circular rose-colored spots. The varieties *albo-punctata* and *roseo-punctillata* have respectively white and rose-colored dots scattered over the surface of the leaf. *B. maculata*: Leaves ovate-cordate, hairy, spotted; flowers racemose, pale violet-purple; a plant of creeping habit, dwarf and ornamental. *B. margaritacea* (*Gravesia guttata magaritacea*): Leaves ovate, acute or acuminate, deep shining olive-green, with circular white spots resembling rows of pearls. *B. marmorata*: Leaves three to eight inches long, on somewhat shorter petioles, green, with a bronzy lustre, and five broad silvery white bands along the five principal veins, bordered with minute spots of white, dull violet below; rose-colored flowers in terminal cymes on scapes six to eight inches high, three-fourths of an inch across; habit erect and robust. This is the best species for general culture, hardy and ornamental. *B. pubescens*: Leaves oblong-lanceolate, green, with a broad chocolate centre covering each side as far as the second longitudinal vein, duller below, very pubescent on both sides; flowers in terminal and axillary umbellate cymes, pure white, with a crimson centre, and yellow stamens; very pleasing; habit dwarf and compact. *B. superbissima*: Leaves with a metallic lustre, covered with large and small circular, bright rose-colored dots; a splendid robust variety. *B. Van Houttei*: Leaves heart-shaped, brightgreen, with five longitudinal, bright rose-colored veins and small magenta-colored dots all over the surface, red below, hairy on both surfaces; leaves spreading; habit compact; tender, but very beautiful. *B. vittata*, *B. punctatissima*, *B. mirabilis* and the probable hybrid *B. Legrelli* are also desirable.

Newark, N. J.

N. J. Rose.

Vergennes and Moore's Diamond Grapes.—These two varieties of grapes originated in very different regions, but they have many characteristics in common. The Vergennes is a true variety of *Vitis Labrusca*, a wild grape of New England. It originated in 1874; at least, the fruit was first seen in that year at Vergennes, Vermont, being fruited by William E. Green, and it was introduced in 1880. Of all well-known pure native grapes it is the best keeper, lasting until the holidays. Catawba is also a long keeper, but this has some European blood in it. The quality of the Vergennes has been underestimated, and it is often condemned for other reasons, but in certain places it is a grape of great beauty and productiveness and of more than ordinary quality. The second grape is Moore's Diamond, the best all-round white grape which I know at the present time. This is not a pure native, but is what might be called three-fourths or seven-eighths hybrid. It is a cross of the Concord and Iona. The Brighton is one of the very best of our modern grapes, and is a cross between the Concord and the Diana-Hamburg. The Brighton and the Moore's Diamond were both originated by Jacob Moore when he lived at Brighton, New York, but who was later a resident of Attica. Jacob Moore has been one of our most successful grape growers, and he was one of the first to conceive the fact that, in order to improve our grapes, it is necessary when hybridizing to use those varieties or types which are themselves hybrids; that is, secondary hybrids, in which the blood of the parents is somewhat diluted or attenuated, generally give better results in grapes, and, in fact, in most plants, than primary hybrids. This is well illustrated in some of Munson's new grapes. The opposite truth is illustrated in most of the Rogers' grapes, which, while excellent in themselves, generally have some vital weakness which unfit them for vineyard use on a commercial scale.

L. H. B.

Cornell University.

Hybrid Perpetual Roses.—The houses which have been filled with Chrysanthemums at the Waban Rose Conservatories are being cleared and filled with these plants. They are pruned, top-dressed, gradually watered, and inured to a forcing temperature of sixty degrees at night. They are grown in boxes, and although out-of-doors from June until frost, most of their growth is made indoors, the season outdoors being little more than a ripening period. For nearly two months the boxes have been

turned sidewise toward the sun to insure a thorough ripening of the wood, and at the same time prevent any fresh and useless growth during the warm autumn months. Nearly all the plants are imported. All varieties will grow, and many will do well on their own roots; Giordani Bruno is a notable instance, making splendid growth on its own roots, but the majority do better and are certainly longer-lived when budded on either the Manetti or the English Dog Rose stock. Varieties on the Dog Rose stock always do better in heavy soils, on the Manetti in light soils, and growers take these matters into consideration when importing.

Japan Anemones past blooming are stored in a cold frame for the winter. This protection is needed to save the crowns, which are nearly always killed when exposed. We have never been successful in whatever means we have adopted to bring them through uninjured out-of-doors. It is not a question of temperature, as farther north they succeed better. One would think American florists might add this handsome flower to their stock in trade. The flowers are produced in such abundance that even at a low price they should be profitable; and by their regular outline they are well adapted to all kinds of floral designs, and equally appropriate for any loose or natural arrangement in vases. Those who propose to use them might prepare a rough frame, and if stock is at hand it had better be planted now. The frames should be lined on the outside with light material to keep out frost, and covered with shutters, and these need not be removed until the following March. The summer treatment is such as we should give Chrysanthemums. During the months of July and August they will take an extra supply of water, and liquid-manure may also be given freely until the buds are well formed. The flowers will open a better color (being naturally creamy white in the variety Honorine Joubert) and last longer when shaded by a light framework of cotton cloth. I have always thought they might be worth the extra trouble and expense of a pitched roof of oiled cloth, open at the sides so as to shed water as well.

Wellesley, Mass.

T. D. H.

Correspondence.

Notes from Wellesley.

To the Editor of GARDEN AND FOREST:

Sir,—The splendid plant of the beautiful New Zealand Clematis *indivisa* in the garden of H. H. Hunnewell, Esq., the specimen which was figured in GARDEN AND FOREST, vol. vi., page 167, again promises to bloom well. By the end of February there will be a grand display of its dazzling white sweet-scented blossoms in the orangery here. Although introduced to European gardens nearly fifty years ago, it is still uncommon. Probably few people take into account the fact that it is a native of the warm temperate regions of the southern hemisphere. It is not hardy in Massachusetts, and blooms only during our winter season. In changing the habitat of a plant it is not always possible to change its season of blooming, and, in consequence, some special treatment is required in compensation. A cool, yet light, glass structure is best suited to this Clematis, where it is subject to as little excitement as possible during our hottest months, and later a thorough ripening preparatory to flowering.

Toxicophœa spectabilis, the Wintersweet, from south Africa, belongs to the order Apocynaceæ, to which also belong the Periwinkle, Oleander and Tabernæmontana. Its small white rotative flowers are borne in axillary whorls, and are deliciously sweet, filling the whole of the large Palm-house with perfume. It is a small shrub with opposite, ovate, dark green, shining leaves.

Here are many fine Palms, and some of the largest specimens that are to be found in the United States, and some which had grown beyond the capacity of the house were sent to the World's Fair. In this country we are badly in need of large structures which will allow of the full development of these magnificent tropical plants. The only one I know in the vicinity of Boston belongs to Joseph H. White, Esq., of Brookline. A large specimen of *Acanthophœnix crinita*, from the Leychelles, is now fourteen feet high, with leaves from ten to twelve feet long. It was introduced into European gardens in 1868, and the specimen here is nearly twenty years old. The leaves are pinnate and gracefully recurving. The under surface of the midribs is covered with long black spines in young specimens. These almost entirely disappear as the plants increase in age, so that now they are to be found only on the lower part of the leaf-stalks.

The magnificent pair of *Phœnix reclinata* which visitors see

gracing the lawn near Mr. Hunnewell's residence in summer are here stored for the winter. They would be worthy of note anywhere. *Kentia Belmoreana* is represented by several plants, the largest of all being sixteen feet high and as many in diameter of leaf-spread. There are fifteen well-developed leaves. These are palmate in form, with the incisions carried to a common centre of the midrib. One of the largest and handsomest specimens of the rare *Licuala grandis* occupies a prominent position in the tropical-plant house. For many years this was one of few plants of this species in cultivation, and many a time Mr. Harris felt anxious about it. It is more common now, and one occasionally sees a small plant of it in private collections. The habit is erect, with leaf-stalks about four feet in length in a well-grown plant. The leaves are distinctly palmate, almost circular, rotate and irregularly notched. It is a native of New Britain, and probably would do as well in a temperature lower than it receives here—sixty-five degrees, Fahrenheit, night. Mr. Harris, however, believes in leaving well alone.

Reidia glaucescens (*Phyllanthus pallidifolius*) is an uncommon and attractive tropical shrub belonging to the order Euphorbiaceæ. It is a native of Java. The peculiar arrangement of the small, sessile, ovate leaves horizontally on opposite sides of the twiggy branches gives them the appearance of being large pinnate leaves, and the odd way in which the shortly pediceled, fringed, salmon-colored flowers hang on the under sides of these stems makes a curiously attractive combination. This is a plant one does not see every day.

Among the many rare and beautiful Orchids a grand specimen of *Vanda coerulea* attracts especial attention now. It is only a moderate-sized plant, but carries a spike eighteen inches long bearing fourteen unusually large bright blue flowers. *V. Kimballiana* is not quite so handsome, but is less common. In general appearance it resembles *V. Teres*. The sepals and petals are white, with a rose-purple stained lip. A large collection of *Cattleya labiata* are now in bloom, and all are good varieties and well grown, a few being very fine. This beautiful species fills the gap between summer and winter flowering kinds, continuing until January. The flowers are borne erect, two or more together, and quite fragrant. The sepals and petals are bright rose, shading to mauve in some and lavender in others. The lip is crimson, varying in intensity, often brilliant, with a yellow throat in varietal differences of shading.

In addition to the Rhododendrons of the Javanicum type as mentioned in bloom several weeks ago, the following may be added: *R. Taylori*, light rose; *Duchess of Teck*, pale salmon; *R. roseum*, bright rose.

T. D. H.

Wellesley, Mass.

Exhibitions.

Flowers at Madison Square Garden.

THE Society of New York Florists omitted this season the usual monster exhibition of Chrysanthemums to which we have been accustomed since this flower became popular. The omission does not indicate so much that the popularity of the flower is on the wane as it does that public curiosity has become sated with a certain inevitable sameness in exhibitions composed mostly of well-grown flowers of limited variety of form. Last week the society held a smaller though more diversified exhibition in the Concert Hall of the Madison Square Garden, it being an auxiliary attraction to the Live Stock show which occupied the amphitheatre. This concert hall is a noble apartment with deeply carved ceiling and many side bays richly ornamented with moulded details, but with no touch of color. The pure white backgrounds furnish a pleasing foil to the color masses below, and higher up the narrow galleries and points of vantage were deftly screened with southern Smilax, an invaluable vine for bold yet graceful effects.

Chrysanthemums, of course, were there in abundance, principally, however, as cut specimens of the best forms and largest size, though fine displays of Pompons were made by Pitcher & Manda and Mr. Leonard Barron, while a few fancy Anemone-flowered kinds were also seen. Dailedouze Brothers, J. N. May and Mrs. J. Hood Wright (C. A. Weller, gardener) divided the honors early in the week for fine specimen flowers. Mr. James Comey, of Lexington, Massachusetts, exhibited a new seedling, Mrs. F. B. Hayes, a well-incurved flower, dark blue-pink in color, which seems promising for a late variety of that shade. Early in the week, also, C. M. Ward, of Queens, gained the silver cup in a strong competition for the best display of Carnations. These popular flowers were shown in great variety and perfect form by all the leading growers, and

were at all times one of the most attractive features of the show.

Naturally, Roses were shown in beautiful form, the prizes going for American Beauties to W. H. Young, of Clifton, New Jersey, and L. M. Noe, of Madison, New Jersey, for Bridesmaid to C. H. Hager, of Summit, New Jersey, for Augusta Victoria to H. Weber & Son, Oakland, Maryland, and for Catherine Mermet and Mrs. Pierpont Morgan to John N. May, of Summit, New Jersey. Mrs. Pierpont Morgan, as grown by Mr. May, is a rose of fine form, brilliant color and most remarkable firmness and stability of petals, in lasting quality quite outclassing all others on exhibition. Whether a cerise Rose will prove a popular flower remains to be seen; a market which rates the American Beauty as the choicest Rose is difficult to forecast. Double Violets were best shown by C. F. Bahut and W. G. Salford, of Poughkeepsie, New York, and single ones by Francois Sapiot, of Philadelphia. The new California Violet did not appear to be a great gain.

Of other flowers Cyclamens were shown by J. M. Keller, of Bay Ridge, in plants in a perfect state both of leaf and flower. Siebrecht & Wadley furnished a bank of choice Orchid-blooms, dainty and effective, and masses of Palms, Crotons, Dracænas, Marantas and the fine foliage plants which they grow so well, and which are at their worst when crowded in a mass at an exhibition. However, Siebrecht & Wadley exhibited also some handsome specimens where their forms could be enjoyed, noticeably a *Pritchardia grandis* in perfect condition. But the honors for unique specimens well grown were easily with Mrs. Charles Pratt (William Anderson, gardener). We see so few of these handsome specimens at public exhibitions that we are apt to forget that in many private places there are yet grown with loving care many splendid plants such as made the reputation of the old-time gardener, but are too often neglected in new houses since the Orchid fever has prevailed. Mrs. Pratt showed a pair of Maylayan Polypodiums, *Goniophlebium subauriculatum*, in about thirty-inch pans, the fronds from which made a cataract of foliage on all sides, the fronds being seven to eight feet long. A pair of *Adiantum gracillimum*, by the same grower, in eighteen-inch pans, were fine specimens, but a rarer one was a large plant of *Cordyline gloriosa* (*Shepardii*), a beautiful form with glossy broad oblong leaves, with markings of a salmon hue on a light green ground. Among other decorative plants a mass of Otaheite oranges on small plants, shown by C. Zellar & Son, of Flatbush, were well grown and effective.

The exhibitors of cut flowers were at a great disadvantage this season, as the prevailing warm weather of the month has been productive of soft growth and undue forcing of flowers, one of the many contingencies of flower-growing which test the skill of the most experienced, and which are especially trying to growers of high-grade flowers. The Carnations seem to have suffered most severely, and they went to sleep even more rapidly than the fugacious Roses. It was interesting to note that Lizzie McGowan and William Scott were the only varieties which held well their true form in the early days of the exhibition.

Quite as beautiful and fragrant as the flowers was a collection of pears sent by Messrs. Ellwanger & Barry, of Rochester, New York. There were seventy-six different varieties represented, every one of excellent quality.

Recent Publications.

Our Edible Toadstools and Mushrooms and How to Distinguish Them. By W. Hamilton Gibson. Pp. 337, 8vo, with 30 colored plates and 57 other illustrations by the author. Harper & Bros., 1895.

In this attractively written and well-illustrated volume the author gives an account of "thirty native food varieties easily recognizable by their marked individualities." As far as possible devoid of technicalities, well spiced with anecdotes and garnished with amusing sketches, it is not a handbook to be used by the novice while collecting in the field so much as a treatise for the amateur who desires in a leisurely and artistic way to add to his stock of gastronomic information. Gastronomy, rather than mycology, is the end which the author keeps in view, and the reader is assumed to be a person with a cultivated palate and one either having in his employ a good cook or himself an expert with the gridiron and the frying-pan. From the days of that agreeable old gourmand, Rev. C. D. Badham, who was so absorbed in the preparation of fungous dain-

ties that one wonders how he found time to write any sermons, writers on mushrooms and mushroom-eating have exhibited an enthusiasm for their subject hardly surpassed by that of the professed Wagnerites in the musical world. Mr. Gibson is also an enthusiast, but his enthusiasm is tempered by an admixture of good sense not always found in books of this sort. We are not given to understand that there is nothing worth eating but fungi and that the millennium is coming when, having learned to distinguish between edible and poisonous fungi, every one will have enough to eat. But it seems to us that some even of Mr. Gibson's statements, or, at least, his quotations, are too rosy. When one reads that "the writer never fails upon any day from April to December to find ample supply of healthy, nutritious, delicate toadstools for himself and family," one must admit that this is an exaggeration. Not a few persons fond of fungi were for several weeks of the past summer quite unable to find enough for a single meal. The simple fact is that at some seasons and in some places edible fungi are abundant, but at other times they are scarce, and to obtain enough for a meal requires considerable searching, while in exceptionally dry seasons there are times when there are practically no edible species to be found. Of course, experienced collectors can reap a harvest where others cannot, but even they sometimes come home empty-handed. It is to be regretted that so many of the inaccurate and sensational statements of Mr. Badham have been constantly quoted in books on mushrooms from 1847 to the present time. They mislead the novice; they bore the expert.

The plan pursued by Mr. Gibson in the treatment of the subject is the only practical one—namely, he describes thirty of the more common species, states their properties and refers the reader to the plates which represent them. Any one who wishes to know how to distinguish what is good to eat must begin by learning the characters of these common species. Later on he can, by consulting other more technical books or by experimenting carefully himself, increase the list of species which he can eat with safety, but this list of thirty species is complete enough for most persons. The descriptions are good and the illustrations generally life-like as well as artistically pleasing. In the plate of the Fairy-ring fungus the color of the gills is misleading, and the upper figure of the plate of the Beefsteak fungus is unlike any form of that species we have ever seen. Plate 29 certainly is not a characteristic figure of *Hydnus Caput-Medusæ*, but seems to us to be rather a young specimen of *H. coraloides*, a species which it appears to be almost impossible to represent well in colors, if one may judge by the classical figures.

Although not a difficult matter in course of time to recognize the thirty species figured by Mr. Gibson, it can hardly be done at once even by intelligent observers, and it is necessary for the novice to have some rules for distinguishing edible from poisonous species. Mr. Gibson gives the rules laid down in the books, but does not appear to place a very high value on them, as there are exceptions to them all. We should attach rather more value to the rules than he does, for it is better that one should err on the side of safety. Until one is more or less expert, it is far better that he should, through ignorance, throw aside certain edible species which form the exceptions to the rules than that he should partake of one of the dangerous forms. The rules are, at first, an important safeguard. The fallacy of the popular tests of the poisonous character of toadstools is well shown by the writer, and he brings out strongly the distinguishing character of the very poisonous Amanitæ, the first point which the fungus collector should learn to recognize. The account of the poisonous action of the Amanitæ is incorrect in some respects. On p. 69, the active poisonous principle, muscarine, is said to be volatile. This alkaloid is not volatile on chemical authority. If it were, one would suppose that it would be dissipated on cooking the fungi, but it is well known that that is not the case, nor have we ever known any one to be injured by handling

Amanitæ, or by sleeping in rooms where they were kept. We have over and over again placed Amanitæ in small bedrooms when on collecting trips in order to kill the flies which annoyed us, and have never felt the least inconvenience therefrom. The flies were effectively killed by feeding on the fungi, not from any exhalations. Furthermore, it should be said that an alkaloid was discovered in *Boletus luridus*, which is said by the chemist who discovered it to be in all probability the same as muscarine, and it cannot be said that we know that muscarine is found only in Amanitæ.

This leads us to speak of one subject on which we think that caution is needed, namely, the dangerous character of the genus *Boletus*. The trouble is not that the greater part of the species of this large genus may not be safe, but that, unlike the few species of *Amanita*, it is often very difficult, even for an expert, to distinguish the species. The Rev. M. J. Berkeley, an authority often quoted by Mr. Gibson, once said to us: "I am now over eighty and have studied fungi many years, but I never feel quite sure of Boleti." If an expert like Mr. Berkeley had doubts, it is well that those of less experience should be very cautious. Mr. Gibson, himself an expert, offers an instance of the uncertainty in regard to the species of *Boletus*. On p. 183 we read: "Many species accredited as poisonous he (the author) has eaten repeatedly without the slightest deleterious consequences, including the crimson *Boletus*, *B. alveolatus*." On p. 207 it is stated: "In plate 24 are shown two examples of the Boleti which have commonly been accounted poisonous—*B. felleus* and *B. alveolatus*—and, in the absence of absolutely satisfactory assurance to the contrary, it is safer from our present point of view to consider them still as suspicious." One is at a loss to understand why the author, if he has eaten repeatedly *B. alveolatus* without the slightest deleterious consequences, nevertheless advises others to regard the species as suspicious. It is true, as he says, that the genus *Boletus* has been unjustly maligned in so far as we know that some species formerly regarded with suspicion are now considered safe. But, on the other hand, it is also true, that if an expert like Mr. Gibson does not feel sure with regard to a species which he has himself tested, it is well that those who are inexperienced in such matters should be given to understand that, with the exception of certain well-known species, the genus *Boletus* should be regarded as doubtful, and not to be eaten except with great caution. We are led to make this statement because persons whom we know, misled by the statements of enthusiastic mycologists as to there being little or no danger in eating Boleti, have been poisoned. Except that we feel, in some cases, that the author has not been quite conservative enough, considering that by far the greater part of his readers must be persons who know almost nothing about fungi, we can heartily indorse the book as a valuable guide to those who wish to become fungus-eaters, scientific enough without being too technical, and excellently printed and illustrated.

Notes.

The Usambara Violet is the name by which the *Saintpaulia ionantha* is already known in Germany.

It is announced in *Science* that the Botanic Garden of the University of Berlin, having become too small for present requirements, will probably be removed to Dahlem to a tract of land of one hundred and twenty-five acres.

Clematis paniculata has come to be recognized as one of the very best of ornamental climbers when in flower, but it is worth noting that the gray feathery tails of its red fruit are very interesting at this season, while the late persisting leaves turn to rich bronze and chocolate colors.

The fourth part of the third volume of the *Contributions from the United States National Herbarium* is devoted to a report upon a collection of plants made by J. H. Sandberg and assistants, in the interesting and little-known region of northern Idaho and the adjacent parts of Washington and Montana

in 1892, by John M. Holzinger. The report contains figures of *Cardamine Leibergii*, a species from the Kootenai country, here first described, and of the rather obscure *Viola orbiculata*, a plant first collected by David Douglas more than sixty years ago.

In the botanic garden at Vienna there has been for many years a Buckthorn shrub named *Rhamnus hybrida*, which sprang from a cross between *R. alpina* and *R. Alaternus*. One of the parent species, *R. alpina*, has deciduous leaves, which are green in summer and wither and drop in the autumn. The other has evergreen leaves, which last through the winter and remain on the branches for two years. The hybrid possesses leaves which do not fall off in the autumn, nor do they last fresh and green for two years, but they maintain their verdure through one winter and fall in the spring when the new shoots are sprouting from the buds.

Some interesting experiments in subirrigation in the greenhouse have been made at the Ohio state station and put on record in Bulletin 61, in which the advantages of growing Lettuce in this way are very plainly seen. We have already discussed this matter at length in former numbers, but any one who desires to learn about the details of the methods should send for this bulletin to the station at Wooster, Ohio. One point is worth noting here. It is generally understood that good head lettuce cannot be grown on heavy soil by surface-watering, but with subirrigation this soil can be utilized, and, therefore, this manner of watering greatly enlarges the possibilities of Lettuce cultivation.

Part VII. of Bulletin No. 9 of Minnesota Botanical Studies contains an important paper on the genus *Cypripedium* with reference to Minnesota species, by Henrietta G. Fox. This is illustrated by a map of North America showing the distribution of the genus *Cypripedium* on the continent, and by plates of *Cypripedium arietinum*, *C. Reginæ* (*C. spectabile*), *C. candidum*, *C. hirsutum*, *C. acaule* and *C. parviflorum*. The present number also contains articles on the Poisonous Influence of the various species of *Cypripedium*, by D. T. MacDougal; Tree Temperatures, recorded by Roy W. Squires; on Some Hepaticæ of Minnesota, by John W. Holzinger, and a Study of some Minnesota Mycetozoa, by E. P. Sheldon.

Mr. John Muir has been expressing some vigorous opinions as to the mismanagement of the Yosemite Valley, and he argues that the state of California should cede the valley back to the United States Government, so that it will no longer be the prey of partisan politics. Mr. Muir declares that the pasturing of horses and the growing of grain have exterminated the beautiful flowers and shrubs which once made the level floor of the valley so attractive. Within the boundaries of the Yosemite National Park, this growth, which had been killed out by sheep and cattle, has been renewed under the guardianship of the national cavalry, but in the valley itself there has been constant deterioration because the commissioners are merely politicians with no taste and no intelligent appreciation of the beauty of natural objects.

Emperor and Cornichon grapes are still coming from California, four car-loads reaching this city during last week. Advance shipments of California Navel oranges are already on the way eastward. Some Havana oranges have arrived, and small lots from Mexico. Arizona oranges are forwarded as far eastward as Chicago, where their good qualities make a ready market for this fruit. The first of the new crop Valencia oranges reached this port yesterday. Jamaica oranges are, however, the main dependence at this time. The season for importing Almeria grapes is nearing a close. The total receipts in New York this year amount to 150,000 barrels, 35,000 more than came here last season. These grapes are of inferior quality this year, and prices have accordingly ranged low. The last sale of the season, announced to take place to-day, comprises a cargo of 10,000 barrels. High prices are maintained for cranberries on account of the short supply. Nearly 2,500 barrels of this fruit were received in our markets last week and twice as many crates, and extra-large varieties commanded \$10.00 a barrel at wholesale.

In a recent number of the *University of California Magazine*, Mr. Charles H. Shinn, in writing of the lavish way in which the best parts of the California forests have been cleared away, states that in the Comstock mines alone enough timber has been used to build all the houses needed for a city of 50,000 inhabitants. He has seen the bottom of a cañon crowded for miles with the trunks of pines from each one of which a few flume-blocks or a log of butt-timber had been cut, while the rest was left to decay. Not to mention the thousands of acres

of the most magnificent coniferous timber known to man destroyed by fires which have burned out the soil itself into great pits, it is stated that the waste of timber in the Redwood districts has been even more appalling than it has been in the Sierras. More than once the world's record for the number of feet cut in a day has been broken by some one of the saw-mills of the coast Redwoods. So much lumber is still produced by rival millmen that it has not paid for cutting, and some of the large California firms of lumbermen have become bankrupt. Enormous trees that represent from 800 to 1,000 years of symmetrical growth have been sawed up with no profit, or with actual loss, when, if they had been left to stand a few decades longer, the profit might have been a thousand dollars an acre. At the time of the American occupation of California the forests covered, perhaps, 50,000 square miles. Half of this has been cut over or is inaccessible, or consists of species of less value than those which have heretofore been cut. It is often asserted that California still has twenty millions of magnificent forest land, but the truth is that there is left hardly fifteen million acres, and much of this has been cut away.

The early and untimely death of George M. Dawson at Halifax is announced. Mr. Dawson was born in Pictou, Nova Scotia, on August 1st, 1849, and was the son of Sir J. William Dawson, principal of the McGill College, of Montreal, and a distinguished geologist. He was appointed geologist and naturalist to the North American Boundary Commission in 1873, and two years later published a report on the country traversed between the Lake of the Woods and the Rocky Mountains. In 1875 he was appointed a member of the Geological Survey of Canada, and has been chiefly engaged ever since in surveying and exploring western British America, and in 1887 was placed in charge of an expedition sent to the Yukon River by the Dominion Government. As one of the Behring Sea Seal Fishery Commissioners he passed the summer of 1891 in Alaska, investigating the facts connected with this industry. In 1893 Mr. Dawson was elected President of the Royal Society of Canada, and in January, 1895, director of the Geological Survey of Canada. Mr. Dawson was specially interested in trees and their distribution in British America, and many important facts relating to them have been gathered during his long journeys in the north-west provinces and British Columbia. Mr. Dawson was the author of many memoirs, principally geological, and several years ago he published in *The Canadian Naturalist* an important paper on the distribution of the trees of British Columbia, and botanists have looked forward with confidence to increased activity in the botanical and dendrological investigations of the survey under his direction.

The death is announced at Charleston, South Carolina, on November 19th, of Francis Peyre Porcher, M. D., LL.D., the distinguished physician and botanist. He was born in St. John's, Berkeley, South Carolina, on the 14th of December, 1825, and was graduated from the South Carolina College in 1844 and from the Medical College of the State of South Carolina in 1847. At the time of his death he occupied the chair of Materia Medica and Therapeutics in this institution. Dr. Porcher was one of the editors of the *Charleston Medical Journal and Review*, and was a voluminous writer on medical subjects. During the War of Secession he was surgeon in charge of Confederate hospitals at Norfolk and Petersburg, Virginia, and at this time published his *Resources of the Southern Fields and Forests*, the work by which he is best known to botanists. This was prepared and published by order of the Surgeon-General of the Confederate armies in order to make known the botanical and other valuable properties of southern plants and their availability for use in a country shut off from communication with other parts of the world. He also published a *Medico-Botanical Catalogue of the Plants and Ferns of St. John's, Berkeley, South Carolina; A Sketch of the Medical Botany of South Carolina, and The Medicinal, Poisonous and Dietetic Properties of the Cryptogamic Plants of the United States*.

George Lawson, Professor of Chemistry for the last thirty years in Dalhousie College, Halifax, died in that city on November 10th. Professor Lawson was an authority on the botany of the Maritime Provinces and the author of several papers on Canadian plants, published principally in the *Transactions of the Royal Society of Canada*, which he once served as President. Professor Lawson practiced scientific agriculture on his large farm in the neighborhood of Halifax, where he resided during the summer months, and for several years before his death was Provincial Secretary of Agriculture.

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLES—School grounds.....	491
The Shrubbery in December.....	491
The Heaths among the Pines in Early Winter.....	Mrs. Mary Treat. 492
Notes on the Flora of a Prairie State.....	Thomas A. Williams. 493
The Papaw, <i>Asimina triloba</i> . (With figure.)	L. C. Corbett. 494
NEW OR LITTLE-KNOWN PLANTS:— <i>Phyladelphus Falconeri</i> . (With figure.)	C. S. S. 494
<i>Crataegus Carrieri</i>	495
PLANT NOTES.....	495
CULTURAL DEPARTMENT:—Irrigation in New England.....	J. H. Hale. 496
Grapes under Glass.....	William Scott. 496
Notes from the Missouri Botanical Garden.....	Emil Mische. 497
Spraying by Steam-power.....	Professor W. E. Britton. 497
<i>Dipladenia Boliviensis</i>	N. J. R. 498
<i>Arbutus Unedo</i>	G. W. O. 498
CORRESPONDENCE:—Does Size Affect the Flavor and Color of Fruits?	G. Harold Powell. 498
Notes from Brookline, Massachusetts.....	T. D. Hatfield. 498
Late-flowering Golden-rods.....	Professor T. D. A. Cockerell. 499
Keeping Grapes through the Winter.....	F. T. Bielecki. 499
RECENT PUBLICATIONS.....	499
NOTES.....	500
ILLUSTRATIONS:—The Papaw, <i>Asimina triloba</i> , Fig 67.....	495
<i>Phyladelphus Falconeri</i> , Fig. 68.....	495

School-grounds.

A VALUED correspondent writes to inquire why we have not more persistently advocated the systematic planting of school-grounds, both for purposes of decoration and instruction. He argues with reason that the place where children pass a large portion of their waking hours during the formative period of their lives ought to be one that will exert a refining influence, whereas in very many instances the school-house and its surroundings, both in country and city, are comfortless, and even repulsive. After adding that a well-selected collection of trees and shrubs and herbaceous plants could be used to great advantage in furnishing object-lessons for the study of botany and for instruction in the elements of practical horticulture, and even of forestry, he inquires why it would not be practicable for us to publish some plans for the laying out of school-grounds so as to give them an educational value in this direction, besides encouraging an intelligent love of what is most beautiful in nature.

We have discussed this subject more than once, and realize its importance, but we are convinced that ready-made plans are rarely helpful to ordinary readers, because the sketches of places usually published give altogether erroneous ideas of the actual appearance of these places when the plans are carried out. More than that, as we have often said, each place has individual characteristics of boundary and surface and outlook, and it must, therefore, be studied by itself. As a rule, about the worst possible design for the development of the grounds about any school-building is one that has been prepared originally for some other place.

Not far from the bank of a river in Pennsylvania we once saw a low stone schoolhouse situated nearly in the centre of a sloping lot of some five acres, about which were scattered broad-spreading Oaks far enough apart as to leave sunny spaces between them, except one group of three trees and a little grove at one of the upper corners. There was no town in sight, and one could hardly imagine a more tranquil place. Certainly it would have been an offense against good taste to import some novelty out of a

map to belittle the grandeur of the Oaks, or to add any shrubs or flowers to such a picture. Even for educational purposes one would regret to see the dignity of such a spot marred by the intrusion of a shrub-border or a flower-bed. There was an abundance of good land all about the enclosure, and in this case it would have been preferable to arrange for object-lessons in horticulture and botany outside of this picture of peace. Too often, however, the schoolhouse stands on the public highway with scarcely any playground but the mud and dust of the road, and no sign of a shade-tree. For such a desolate place there is absolutely no excuse. Of course, there should be an enclosed playground connected with every school, both in the country and city. In the country, at least, it would cost but a trifle to add to the playground proper a neatly grassed area, with a bordering shrubbery and some well-kept shade-trees. Where the playground is thus separated from what may be called the garden the usefulness of the latter will largely depend upon the interest taken in it by the children. We have recorded instances where the pupils of schools, having been invited to help in the planting and care of school-grounds, came to cherish them with a real affection which has survived until long after their entrance into active life. The conduct of school boys, as well as of their elders, is largely controlled by traditions, and it has been proved over and over again that a feeling of local pride can be engendered which persists through successive generations of children, and insures such a regard for a place that there is little fear of any attempt at its wanton defacement. If prizes were offered in every county for the most tastefully planted and carefully maintained school-grounds, the spirit of emulation could be effectively added as another incentive to beautify and protect them.

In crowded cities, where the pupils in every school-building are counted by hundreds, it will hardly be possible, as a rule, to have school-grounds sufficiently spacious to furnish at once an outdoor gymnasium and a pleasure-garden. There are few places so contracted, however, that they will not admit of some planting along the walls, where vines and flowering herbs can be made to flourish. Window plants, at least, can be introduced into the school-room, to cheer and brighten what too often is a bare and forbidding apartment, and to furnish object-lessons for elementary instruction in horticulture and botany. But in the country there are few places where it is not possible to have a real garden, with carefully labeled plants and shrubs and trees—a garden for which children can be made to feel a sense of responsibility, and in which they will take an active interest. If they are called to assist in caring for and cultivating the plants, they will be able to gain in a delightful way many lessons in cleanliness and order as well as in natural science, and they will acquire the habit of observing closely beauties of structure and adaptation in every form of vegetation, a habit which will bring increasing delight and refreshment to its possessors all through their lives.

The sum of the matter is that the expenditure of a few dollars and a little careful thought in furnishing the school-building and planting shrubs and native trees about it will transform the house and grounds from an appearance of discomfort and squalor to one of cheerfulness and beauty. But this planting will do more than exert a softening and civilizing influence upon school children. It is well known that school gardens play an important part in the educational system of many countries, and certainly practical instruction in this direction is needed in the United States, if it is needed anywhere. If a few of our native trees and shrubs were planted in the grounds of every district school, and teachers took pains to call attention to their names and characters and modes of growth, there would not be as many men and women in the country as there are now who cannot distinguish our commonest species of Oaks or Maples or Hickories. No extensive arboretum will be needed for such study. With a few trees for illustration and comparison it will not

be difficult to arouse an interest which will lead the student of nature to the neighboring woods and roadsides for additional knowledge of our trees and their uses, their histories, their relationships and distribution. In a recent address by the Secretary of the Minnesota State Forestry Association, it is justly contended that the foundation for systematic forestry is best laid in the school-house lot, for if we are ever to have a stable forest-practice throughout the country it must rest on the general knowledge of trees and their importance to the whole community. This knowledge ought to begin in the primary schools. The youngest school boy is old enough to find the study of the school-garden the most absorbing of all his occupations.

The Shrubbery in December.

SHUBBS with brilliantly colored bark or with persistent bright fruit appear to the greatest advantage in these clear, cold December days, and make parks and shrubberies where such plants are skillfully massed exceedingly interesting. In our country they should be more largely employed than any one has yet used them, because during several weeks after the leaves have fallen from most trees and shrubs we have here delightful, sunny, crisp days, when it is a pleasure to be out-of-doors, and parks should be made as beautiful as at any other season of the year.

The shrubs whose bark is now the most brilliant are the red-stem Dogwoods, principally the North American *Cornus sericea* and *Cornus stolonifera*, and the Old World *Cornus alba* and its Siberian variety, the Japanese *Kerria*, with its bright yellow-green, slender, graceful stems, and several of the yellow-stemmed shrubby Willows. Massed together these plants now make a handsome and agreeable combination of color.

Of fruits borne by shrubs none is now so brilliant as that of the Japanese *Berberis Thunbergii*, which is loaded with its bright scarlet berries; and these retain their freshness and beauty until after the leaves appear in May. It is interesting to note that as quails are particularly fond of these berries, *Berberis Thunbergii* can be planted with advantage where it is desirable to furnish these birds with winter food. Every year makes the value of this excellent shrub appear greater, and the ease with which it can be raised from seed, and its hardiness, which enables it to flourish as far north, at least, as Ottawa, in the Province of Quebec, make it possible to cultivate it on a very large scale, and to place it within the reach of every one. Other shrubs which are just now conspicuous with brilliant scarlet fruit are the native Black Alders, *Ilex verticillata* and *Ilex laevigata*. Of these the latter, although the more beautiful of the two plants, is comparatively rare and very little known, except by botanists.

Some of the American Thorns can well be used where it is desirable to produce winter effects with deciduous-leaved trees. The scarlet fruit of the Washington Thorn, *Crataegus cordata*, is just now beautiful; it is not large, but very lustrous, and it retains its freshness quite late into the winter. At all seasons of the year this is a desirable little tree, and it is hardy and grows rapidly. The flowers appear in the early summer, after those of the other Hawthorns are gone, and its shining nearly triangular leaves turn late in the autumn to bright shades of orange and scarlet. It is probably most beautiful early in November, for the color of the fruit is heightened then by that of the foliage, the two blending and harmonizing perfectly. The fruit of the Cockspur Thorn, *Crataegus Crus-galli*, is now at its best, and often quite covers the branches from which the leaves have all disappeared. The fruit of this species is much larger than that of the Washington Thorn, but it is dull, and red, rather than scarlet, in color. But the most showy fruit of any of the Thorns at this season of the year is that of *Crataegus Carrieri*, a probable hybrid of which some account is given in another column of this issue.

This list includes but a few of the shrubs whose bright colors delight the eye in early winter. These ornamental

fruits persist on some of them all winter, and there is a delicacy of tint in the branchlets of a shrubbery which is never as charming as when the ground is covered with snow. One who knows trees and shrubs only when they are in leaf and flower knows only half their beauty.

The Heaths among the Pines in Early Winter.

THE attractiveness of the Pines in winter is largely due to the Heath family, which is the best represented order of woody plants in our region. One of the chief charms of the deciduous members of the order is in the diversified forms and colors of the denuded branches and twigs. The soft and downy young shoots of the Stagger Bush, *Andromeda Marianna*, are reddish brown, and below them, on last year's growth, are snuggled the scaly buds which, in spring, will open into delicate clusters of white waxy flowers. *A. ligustrina*, though not as handsome as *A. Marianna*, is, nevertheless, quite interesting now and at any time during the winter. This species also has its flower-buds in clusters on the branchlets of last year.

The two species of *Leucothoë* in the Pines are both deciduous. *L. racemosa* is tall, compact, straight and clean-limbed, and all the new growth is a deep red color. *L. recurva* is much lower and more straggling. The flower-buds, formed during summer, are arranged along the stems of this year's growth in both species; they terminate the branches in long racemes, and some of the buds now look almost ready to expand, but they will not unfold, however warm it may be, until spring. The three species of *Gaylussacias*, familiar here, are also interesting studies now. The little creeping *G. dumosa* is still holding its leaves, but there is no difficulty in finding the numerous scaly buds which inclose next season's racemes of handsome flowers. The taller shrub, *G. frondosa*, has slender upright gray branches now bare of leaves. From the scaly, conspicuous buds next spring will burst drooping slender pedicels of reddish bell-shaped flowers, followed by sweet, edible berries which are often found in markets under the general name of huckleberries. Less tall than *G. frondosa* is the more straggling *G. resinosa*. The leaves are gone from this species, too, but the numerous clustered buds promise abundant flowers, and later the shining black edible fruit.

The *Vacciniums*, or true Huckleberries, are well represented in the Pines. *V. Pennsylvanica* is a dwarf straggling bush, growing in dry sandy places. The large, scaly flower-buds are easily recognized from the leaf-buds. The flowers open a little before the leaves appear, and are followed by large, sweet, delicious fruit, ripe by the last of June and early July. The numerous fine seeds of the fruits of the *Vacciniums* are not objectionable as are the ten large, long seeds of the *Gaylussacias*. In similarly dry sandy tracts grows the low shrub, *V. vacillans*; its fruit ripens later and is less luscious than that of *V. Pennsylvanica*. Both species have green branches throughout the winter. In the damp Pines the Swamp Huckleberry, *V. corymbosum*, and its numerous forms are abundant, the bushes of the different varieties being of various sizes. The branches show a wide range of color, some having a purplish tinge in winter, others red and yellowish-green. There is even greater diversity in the form of the flowers and fruit; some bushes bear broad flat berries, while others have nearly round fruit, and still others pyriform. While the quality of all is good, that of the large flat ones is the best.

But no plant among the Heaths is more attractive in winter than *Rhododendron viscosum*, the white Swamp Honey-suckle. The large terminal scaly flower-buds are variously tinted, as are also the twigs and branches and leaf-buds. In striking contrast is *Clethra*, which grows by its side. This shrub is almost wholly a dull gray color, nearly all the branches and twigs being surrounded with dry gray seed-pods. The evergreen members of the family are always interesting. The thick, shining leaves of the broad-leaved *Kalmia* and the varied color of the branchlets which

hold the leaves are a charming feature of the Pines. The low Laurel helps to give the damp places a fresh green look all winter long. Another attractive little plant at this time is Cassandra. The flower-bud carried in the axil of each small green leaf even now shows the white tips of the corolla reaching out beyond the rigid sepals. Another small denizen of the Pines, the Sand Myrtle, *Leiophyllum*, bears numerous tiny shining leaves; on some plants these have a purple tinge, while on others they are bright green. The scaly flower-buds terminate the branches, from which in May fine clusters of small white flowers will appear, bearing purple exserted stamens. The creeping evergreen members of the family also claim admiration in winter. The white and pink tips of the Trailing Arbutus are already peeping out from the clusters of scaly bracts, and the bright scarlet spicy berries of the Creeping Wintergreen are conspicuous among its handsome aromatic foliage. Especially handsome are the thick evergreen leaves of the Chimaphilas, or Prince's Pine, especially those of *C. maculata*, with white variegation on the upper surface. The Pyrolas are almost always near neighbors to the Chimaphilas, especially some of the forms of *P. rotundifolia*. Both the Chimaphilas and Pyrolas are still holding their old flower-scapes, with dry seed-pods standing well above the shining leaves.

But the Heath family is not the only attraction in the Pines at this time. The younger plants and shoots of *Magnolia glauca* are holding their large glossy leaves, and the silky leaf-buds, with their sheathing wrappings one above the other, make the plant more interesting now than it is in summer. By the side of Magnolia the dark gray twigs of the Bayberry are thickly scattered over with small red buds, and each branchlet is surmounted with a cluster of fragrant leaves which will remain until spring. Small downy buds are ranged along the stems of the Sweet Fern, and most of the twigs are terminated with a raceme of embryonic catkins, which will gradually grow in length each pleasant day. The sweet-scented leaves have mostly fallen, but the plant has an agreeable perfume all winter.

One of the most interesting plants for winter study is the Alder, *Alnus rugosa*. The branches are a metallic-gray, terminated with clusters of sterile catkins, which are now reddish brown and about an inch in length. The fertile clusters are the same color, but much smaller, and below the sterile ones. Both kinds are destitute of wrappings, while the gray leaf-buds have scaly coverings. During a warm spell in winter the catkins visibly elongate, sometimes in a few hours, often to be speedily checked by sudden cold. The old fertile catkins help to decorate the plant all winter; they resemble clusters of small cones and are filled with seeds, which readily scatter with handling. The Fringe-tree is a uniform gray, the new growth in no way differing from the old, and the buds are scarcely perceptible at this time, but by February there will be a marked change in their appearance. Four species of *Ilex* help to enliven the Pines; the well-known Holly and Inkberry are evergreen, while the Winterberries, *I. verticillata* and *I. laevigata*, lose their foliage, but hold the bright red berries all winter.

Situated near large cities as we are, our Pines begin to show the devastating effects produced by the demand for Christmas green each year. The Mistletoe has almost entirely disappeared, and the Holly is fast following in its wake. Last year even my garden was invaded, and three Hollies full of fruit were almost entirely ruined by vandals, who with axes hacked off branches as high as they could reach. A reward for their apprehension failed to bring the culprits to justice.

Vineland, N. J.

Mary Treat.

How clean and hardy and wholesome is the Shrub Oak now, tenacious of its leaves, which shrivel not but retain a certain wintry life, not wrinkled and thin, like those of the White Oak, but full-veined and plump, sun-tanned above to the fast color that Nature loves, the color of the deer and of the cow, and silver-downy beneath towards the russet fields.—*Thoreau*.

Notes on the Flora of a Prairie State.

I.—THE DIAMOND WILLOW IN SOUTH DAKOTA.

PERHAPS the most characteristic woody plant of the region drained by the upper Missouri is the so-called Diamond Willow. The peculiar clumps of this Willow, *Salix cordata*, make one of the most prominent features of the vegetation along the watercourses of the region. They may be seen standing at the water's edge, forming a striking fringe to the winding stream, or along the margins of the moister sloughs and the bayous of the low bottoms, and these bayous are usually formed by the changes which take place in the course of the bed of the stream.

This Willow always grows in these characteristic clumps, which are formed by the development of sprouts from the original plant. In the larger clumps the first or oldest stem is usually dead or dying, and the gradual formation of the group of stems can be traced in the successive growth of new shoots which has plainly taken place. The main stem may reach a diameter at the base of from three to eight, or rarely twelve or fourteen, inches before dying. The height attained may vary from ten to thirty feet, depending largely upon the conditions under which the plant has developed. These clumps may consist of from three or four to several hundred stems each.

The bark of the young growing plants is gray and quite smooth at first, becoming more or less broken and darker in color as the stems become older. The young twigs may be either smooth or pubescent. The sapwood is white, and in the older plants is quite thin as compared with the heart-wood, which is firm, of a reddish color and very durable. The settlers regard it as very valuable for fuel, stakes, rails, etc. Posts made from it are said to be as lasting as those from Red Cedar. In eastern Nebraska and western Iowa this Willow has been quite highly prized for use as stakes in rail fences. I have known stakes and rails to be in constant use for over twenty years.

Many theories have been advanced to explain the origin of the so-called diamonds which form on the stem. It seems quite likely that their origin is mainly physiological, and that their formation is influenced largely by certain physical conditions or phenomena. When the shoot is growing rapidly and is not too badly crowded, few or no diamonds are formed; but when growth is less vigorous and the branches get too thick and begin to die off, crowded out by their stronger neighbors, the formation of the diamonds begins. While these markings vary greatly in size and shape, the general outline is that of an ellipse, pointed at each end, with the branch in the middle and the long diameter parallel with the axis of the plant.

The best explanation of the formation of these diamonds seems to be that when a twig dies the cambium tissue also dies for some distance about its base; a mass of firm, protective tissue is formed at the edge of this area, and each season, as the stem grows, instead of healing over the wound, the growing tissue is forced back further and further and the diamond keeps increasing in size. The bark usually adheres very closely to the wood over the dead area and thus helps to prevent the tissues from growing over the wound. It seems that certain insects may aid in the formation of these markings by killing the branches or boring into the wood about their bases. The diamonds are always more numerous on a slow-growing stem than on one that has been thrifty and of rapid growth. It is not unlikely that the rigorous climate of the upper Missouri valley has something to do with these peculiar deformities.

The excessive development of these areas seen on many of the stems gives them very odd shapes. Sometimes the diamonds may be arranged quite regularly on four sides of a stem, causing it to take on a quadrangular outline; at other times they may be on three, or even two sides; again, they may be scattered irregularly over the entire surface for a considerable distance, and then be almost entirely wanting over a like area. It is not an uncommon thing to find a large stem so flattened in places as to have

a short diameter of but one or two inches, while the long diameter may be many times as great. Perhaps the same stem may be quite regularly cylindrical a few feet above and below this place.

The Diamond Willow occurs more or less plentifully throughout the entire state of South Dakota. Specimens are in the college herbarium from many localities in the Big Stone region, the Sioux Valley, the James Valley, the Missouri Valley, the Cheyenne Valley and the Black Hills. It is particularly abundant in the valleys of the Sioux and the Missouri rivers.

In eastern Nebraska, where this Willow is also quite common, it is often called Red Willow. It does not form diamonds so abundantly here as it does in Dakota.

State Agricul. College, Brookings, Neb.

Thomas A. Williams.

The Papaw, *Asimina triloba*.

THE papaw is one of our native fruits which are comparatively unknown outside the region to which it is indigenous. Horticultural writers have either overlooked it or have known so little of it that they avoid the subject. With the possible exception of Wheeling, West Virginia, and Pittsburg, Pennsylvania, none of our cities ever offer it in their markets. Why this should be it is hard to say, for persons familiar with it, as grown and ripened in our native woods, prize it more highly than any of the tropical fruits sold by city venders. Perhaps this home demand consumes a large percentage of the natural product, and thus keeps it a rarity in the markets.

I believe it is generally supposed that the papaw is peculiarly a southern fruit and that it cannot be grown far north; this is a mistake, however, as its natural distribution is quite well northward, the tree being found indigenous in the province of Ontario. It is also native to sections of New York, Pennsylvania and the states to the southward, and in Massachusetts and New York it has been successfully fruited under cultivation. The specimens produced in Massachusetts are said to be small in comparison to the average size of the same fruit farther south. The tree in its northern home is reported to be perfectly hardy, however, and to have borne fruit since it was ten or twelve years from the seed. At the time the above report was made the tree was thirty-five years of age.

In New Jersey, upon the grounds of Mr. Carman, editor of *The Rural New-Yorker*, this tree has been growing for more than twenty years, the tree having originally been taken from the forest. The most remarkable specimen of this tree under cultivation is presumably one located upon the grounds of Thomas Meehan & Sons, of Philadelphia. These trees are now more than forty feet in height and a foot in diameter. Other large specimens are spoken of in Ohio, but, as usually met with, the Papaw is a large shrub or small tree, leading one to class it among shrubs rather than trees, although it is a tree in every sense of the word, but, unlike many of our fruit-producers, it bears its largest crops, in proportion to its size, when quite young and in a comparatively shrubby form.

The fruits are variable in size, ranging from two to six inches in length and from one to two and a half inches in diameter. The flesh is soft and pulpy, much resembling that of an overripe banana; the rind is thin and adherent, and is generally eaten with the pulp, which is very rich and sweet—rather too sweet upon first acquaintance, but not more so than some bananas. Instead of being seedless, as the tropical fruit, it contains a variable number of large date-like seeds, the Papaw-seed being much larger and more flattened than those of the date. The form of the seeds, as well as their peculiar arrangement in the fruit, is clearly shown in the illustration on page 495. As will be seen in the section of the fruit, the seeds are arranged in a double row, one upon each side of a slight median mark shown on the fruit, and they are set in edgewise in two ranks, except at the ends, where a single seed caps the termination of the rows. In small fruits the two rows of

seeds are less clearly marked and an uneven number of seeds is more often found. A fruit three inches long will not infrequently contain seven good-sized seeds.

The surface of the shell of the seed is glossy as though varnished, and in texture is as hard as horn, being quite indestructible in contact with the soil. They have frequently been plowed up in fields where they have lain twenty years or more and apparently as sound at the end of that period as when first buried. It is Nature's method to plant these seeds in the fall, and if we are to be successful in propagating the tree from seeds we must imitate Nature closely and plant them as soon as possible, after removing them from the fruits, or stratify them in the sand and plant the succeeding spring.

The Papaw is said to be a difficult tree to transplant successfully from the forest, nevertheless we know many instances where such removals have proved satisfactory. Like many other plants that have not been domesticated, the Papaw is best transplanted when quite young and small. The methods of propagating this tree deserve attention, for even in the wild plants we find great variations in the size and season of ripening, and if this fruit is to be brought under cultivation, of which it is certainly worthy, we must find simple and practicable methods of perpetuating varieties. At present our only resource is to grow plants from seed or from layers. By the first method we can only expect valuable offspring, while the second method is a slow and unprofitable way of increasing tree-fruits. The art of budding and grafting this plant is, so far as I can learn, unknown.

Besides its value as a fruit-bearing plant, the Papaw occupies no mean place among ornamental species, and in this particular it is more widely known than as a producer of fruit. Its peculiar and attractively colored flower-clusters, appearing before the leaves in the spring, would be a pleasing novelty for the lawn; its large leaves, often a foot in length and four to six inches in width, give it an effect of tropical luxuriance; and after these have fallen the spherical furry buds of a rich brown color contrast very pleasantly with the soft drab of the bark. One can hardly understand why a native plant possessing as many worthy features as this one should have remained so long in the background.

West Virginia Experiment Station.

L. C. Corbett.

New or Little-known Plants.

Philadelphus Falconeri.

UNDER this name there was received at the Arnold Arboretum, in 1881, from the Parsons' Nursery, in Flushing, New York, the plant which is figured on page 497 of this issue. Of its origin nothing is known, and I have not seen it in any European garden or herbarium. It is certainly not an American species, and is, perhaps, only a monstrous form of the widely distributed and variable *Philadelphus coronarius* of the Himalayas and western Asia. From some Japanese forms of this plant it differs only in its more acute calyx-lobes and in its elongated, narrow petals, which distinguish this plant from all other species of *Philadelphus*. The fact that about thirty years ago many plants were sent by Hogg and by Hall to the Parsons' Nursery from Japan gives some ground for the belief that *Philadelphus Falconeri* is of Japanese origin, or that it is a Chinese plant cultivated by the Japanese in their gardens, for it is not now known to Japanese botanists.

Philadelphus Falconeri, a name which is only used provisionally and until something more of the history and origin of this plant can be determined, is a beautiful shrub here, with spreading stems, eight or ten feet tall, and ovate-acute, smooth, glabrous three-nerved leaves furnished above the middle with a few minute remote teeth, and about two and a half inches long. The flowers are fragrant and are borne in few-flowered lax panicles, on elongated slender, glabrous pedicels, and are about an inch long, with ovate-acute

glabrous calyx-lobes rather less than half the length of the narrowly obovate acute white petals. The fruit is not distinguishable from that of *Philadelphus coronarius*, except in the rather longer calyx-lobes.

Philadelphus Falconeri is a hardy and graceful shrub and one of the most distinct and beautiful members of a genus distinguished for abundant handsome and fragrant flowers. Our illustration, which is made from a plant in the Arnold Arboretum, is published to draw the attention of gardeners to a valuable hardy shrub which is still little known, with the hope that it may lead to some information with regard to its origin.

C. S. S.

Crataegus Crus-galli, the winter buds, flowers and leaves resembling those of that species, but the fruit is certainly very distinct in form and color and in the consistency of the flesh, and it is, perhaps, a hybrid in which *Crataegus Crus-galli* has played an important part, but, whatever its origin or relationship, *Crataegus Carrieri* is a beautiful hardy little tree, and one of the most desirable of all plants that bear showy winter fruit.

Plant Notes.

OXYDENDRUM ARBOREUM.—The Sorrel-tree, or Sour-wood, presents a pleasing appearance at this season in regions

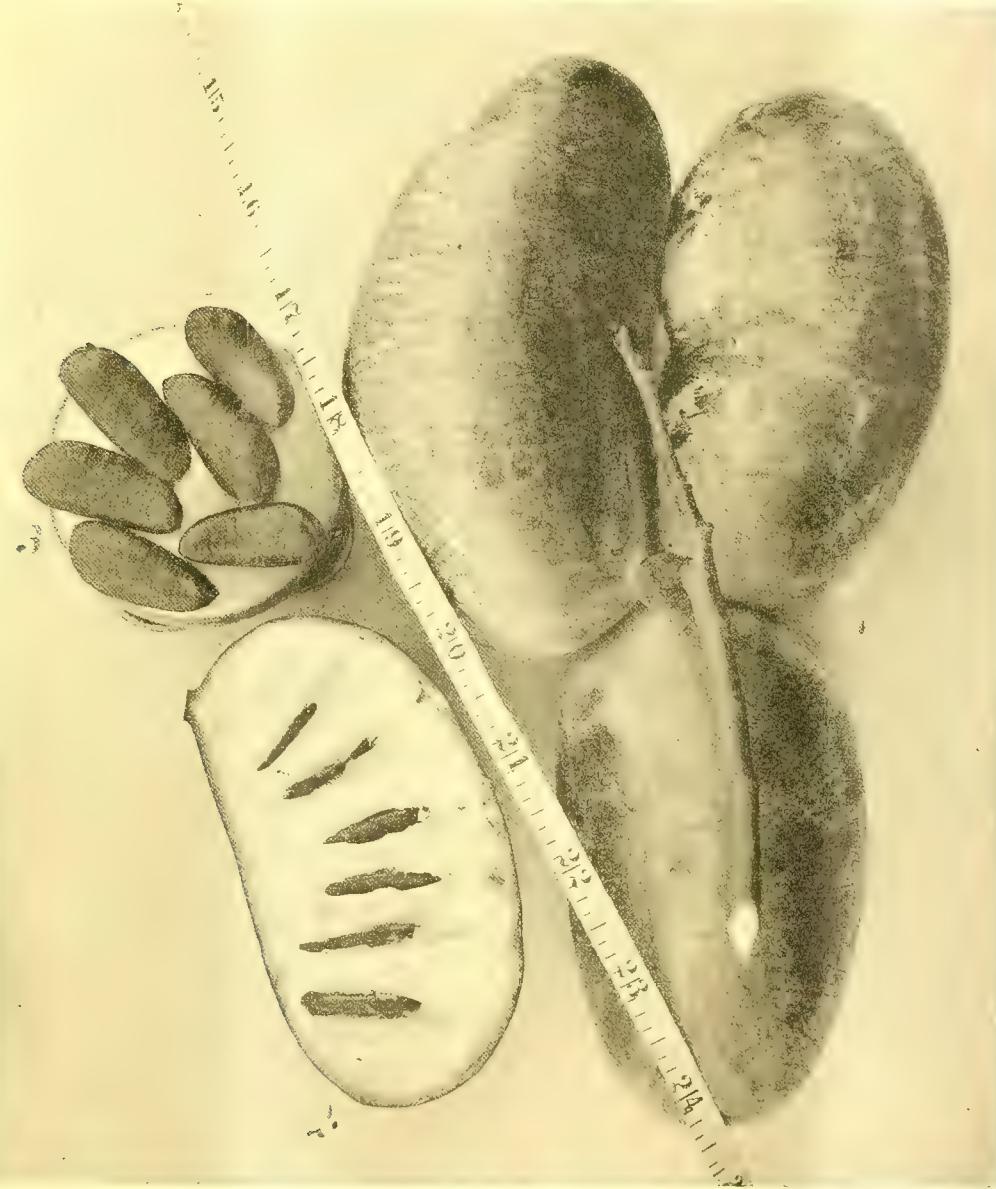


Fig. 67.—1. Fruit of the Papaw, *Asimina triloba*. 2. Section of fruit. 3. Seeds.—See page 494.

CRATAEGUS CARRIERI.—This Thorn is now well established in the Arnold Arboretum, where it is covered this year with fruit; this is oblong, about three-quarters of an inch long, bright scarlet and very lustrous, hanging on long stems in open few-fruited clusters. This tree originated in the Jardin des Plantes, in Paris, and is said to have been raised from a seed of *Crataegus Mexicana* which Carrière had planted when he was at the head of the nursery department of that establishment. It was first described by him in 1883 in the *Revue Horticole*, where a beautiful colored plate represents the flowering and fruiting branches. *Crataegus Carrieri* has generally been considered a form of *Crataegus*

where it assumes tree-form, from the beauty of its deeply furrowed gray bark and its reddish bronze and orange-colored branchlets. In the northern part of New England, however, it is rarely more than a shrub, although in the southern Alleghany region it is a graceful and slender tree fifty or sixty feet tall. In spring, as they unfold, the shining leaves are a bronzy green; when fully grown they are large, bright green and lustrous, and in the autumn they turn to colors which rival those of the Dogwood and Tupelo. In fact, in the splendor of its autumn foliage it is not excelled by any American tree. Its flowers, which appear in midsummer, are pure white, bell-shaped, a quar-

ter of an inch long, borne in a spreading panicle of one-sided drooping racemes at the end of the leaf-branches of the year, and, from their shape, arrangement and color, the Oxydendrum is often called the Lily-of-the-valley Tree. In autumn, among the glowing foliage, the racemes of yellow fruit add to its general interest. The tree was grown in England as early as the middle of the last century, and yet it is a comparatively rare inhabitant of American gardens, although there is no reason for this neglect. It is easily raised from seed; it is not difficult to transplant and it is hardy as far north as Boston. Its leaves are subject to few injuries by insects or fungi; its flowers appear at a season when few other trees are in bloom; the splendor of its autumn colors is unsurpassed so that there are few of our small trees which better deserve attention. It is often sold in nurseries as *Andromeda arborea*. Oxydendrum is a monotypic genus, consisting of this single American tree. The generic name was given to the tree on account of the pleasant acid taste of the leaves.

TECOMA CAPENSIS.—This is a useful greenhouse climber, and it is especially valuable because it can be kept low and bushy when this is desirable. It flowers at different seasons of the year, but particularly during late winter and early in spring. The bright color of its flowers renders it particularly attractive at this season when highly colored flowers are scarce. They are produced in clustered racemes from the apex of ripened side-shoots, measuring more than two inches in length, and are of a bright orange-scarlet color, with a more slender tube than those of *T. radicans*. The foliage is evergreen, but resembles that of our native Trumpet Flower, and a bright shining green in color. This plant should be grown in comparatively small pots, so that the ripening of the flowering branches will be hastened and the plant become sturdy and bushy. It is possible to grow it as a climber, but it is more profitable to shorten all long branches during the growing season, thereby encouraging the formation of flowering side-shoots. The best soil for it is a rich fibrous loam, with an addition of well-rotted manure. During the summer the plants may be placed in the open air with the pots sunk in the ground in an open and sunny position. During this period watering should be carefully attended to, but not overdone. This Tecoma is propagated by cuttings of ripe wood in a sheltered position out-of-doors in summer, or by herbaceous cuttings which root in a few days when placed in bottom-heat and kept moist at any time of the year. For many purposes this is one of our best greenhouse and house plants. The foliage in itself is very pleasing, and when the beautiful flowers appear the effect is highly ornamental. When grown in a house the sunniest window and the most airy apartment is best for the development of its full beauty.

BEGONIA SAUNDERSII.—None of the shrubby Begonias surpass this species in grace of form. It is tall, with slender stems and obliquely cordate leaves of a deep glossy green on slender petioles an inch long. The flowers are borne in immense cymes on very long and slender peduncles from the axils of the upper leaves. Male and female flowers are produced on separate cymes. The former have six petals, almost obovate in outline, half an inch or more in length; the male flowers have only four petals and are rather smaller. The color is a very bright rose, and the effect of a good specimen in full flower is exceedingly pleasing. It flowers late in summer and continues in bloom during autumn and early winter.

MILTONIA CLOWESII.—Among the dainty Orchids known as Miltonias, this is, perhaps, the most picturesquely beautiful. It is a tropical Brazilian plant, and should be grown in the warmest section of the Orchid-house in a half-shady position. During the growing season, like all other Miltonias, it requires plenty of water, and it does not resent a little manure-water now and then. It is generally grown in shallow pans or pots in peat and sphagnum, preferably with an addition of charcoal. The flowers are borne on long nodding peduncles in loose racemes. They measure three inches or more across. The petals and sepals are spread-

ing, long, linear or slightly lanceolate, with the edges turned back in the middle; yellow, barred with rich brown, well-marked blotches. The lip is entire, cordate; purple, with a conspicuous white apex. The leaves are long and graceful, produced from ovate, smooth pseudo-bulbs, from the base of which a number of white, thread-like aerial roots add, in their way, to the beauty of the plant. It flowers during the autumn months.

Cultural Department.

Irrigation in New England.

UNCOMMONLY dry seasons, like the one we have lately experienced, naturally suggest the subject of irrigation, and some persons have come to feel that although this may not be a necessity among the hills of the north-east as it is in the plains of the west, nevertheless some method of artificial watering would often pay in the middle and New England states. Mr. J. H. Hale has asserted that the time will come when the streams of New England will be of more value to agriculture than they ever have been to manufacturing, and in the late number of the *Hartford Courant* he describes a project for using a little brook that runs among the hills in a distant part of his farm to help out his crops in time of drought, as follows:

The main features of the plan are a small reservoir up among the hills, which forms a sort of pocket for a lively brook which has never been known to go dry, and a line of pipe of a little over 5,000 feet, practically a mile, with a fall of 107 feet from the reservoir to the house. Instead of carrying the main by the shortest and most direct route, as soon as the grade will permit it is turned off and follows along the ridges of the farm, which form a sort of backbone all the way down to the street. About every two hundred feet along this line hydrants are being put in, and from these water can readily be carried on the surface of the ground in two or three directions in every instance, and it is believed that there is sufficient water to thoroughly irrigate from twenty-five to thirty acres of land by surface irrigation in this way, the contour of the land and the character of the soil being such that water can be run down between the rows of plants and trees, so as to give a very even and satisfactory distribution. An enterprise of this kind, of course, is quite an expense for a single farm, but through neighborhood co-operation a very much larger pipe could have been put down in the same ditch, and by building a heavier dam and a greater storage reservoir there is no reason why just such a little stream as this might not be made to irrigate a half-dozen or more farms in its immediate vicinity.

Grapes under Glass.

AS a general rule, the black varieties of grapes are preferable to the white ones for growing indoors and especially for market, where they usually bring the top price. Nevertheless, no black grape has yet been introduced which excels the White Muscat of Alexandria in flavor and general good qualities as a table grape. But, assuming that the same price could be obtained for such varieties as Black Hamburg, it would not pay the market grower to grow Muscat of Alexandria, as it is a much harder grape to handle, being shy both of setting and stoning, and is never such a certain cropper. It requires, too, a higher temperature all through to bring it to perfection. We often see these two above-named varieties grown together in an early house, where the black does fairly well, but for early work, if a white grape is really desired, I should prefer to substitute Buckland Sweetwater, as it ripens from two to three weeks earlier than the Muscat, and this means a great deal at the beginning of the season. Although the Buckland Sweetwater is a very good grape, it does not possess the high qualities of the other, and in substituting it we sacrifice several points in quality for the sake of earliness. For the second house we should commend Black Hamburg for market, but for private use we would add a few rods each of Muscat Hamburg and Mandersfield Court for black, and Muscat of Alexandria for white. Mandersfield Court is an excellent grape, but it bursts badly, a trouble which can be prevented either by girdling with a stout string or cutting the shoot half through a little below the bunch. This bursting takes place when the berries are nearing ripeness, and when the first signs of it are observed some means must at once be taken to check the flow

of sap. This a good keeping variety, and may also be used, if desired, in a late house, but for late work, either for market or home use, it is hard to find two better grapes than Barbarossa and Gros Colman. For keeping qualities, Lady Downes is probably the best late grape; it is also an excellent table grape, but both bunch and berry are small compared with the two foregoing varieties.

Tarrytown, N. Y.

William Scott.

Notes from the Missouri Botanical Garden.

ON a two-year-old seedling stock of *Robinia Pseudacacia* from the nursery a cion of *R. hispida* was cleft-grafted two years ago, and it now shows four strong, sturdy branches, each four feet in length. Last spring the profusion of large, deep rose-colored flowers made a splendid spectacle. We find *R. Pseudacacia* an excellent stock to work on, because it continues a gradual growth from spring until the fall, and then ripens up properly before winter. The only objection is that in exposed situations the growths are apt to be broken off dur-



Fig 68.—*Philadelphus Falconeri*.—See page 494.

ing summer or fall by the wind. It would seem to be suitable for forcing as a greenhouse-plant, where staking would overcome this. It lasts in bloom from two to three weeks. Naturally early-blooming plants are sought for forcing, but while this is not quite as early as Deutzias or Syringas by from five to thirty days, according to season, still its delicacy of bloom, its foliage and possible ease of culture recommend the trial we intend to give it.

The English horticultural journals, especially, have been recommending the planting of early spring-flowering bulbs in the lawn for years, but few persons here seem to adopt the idea. We have always found it a good plan, and these spring flowers are never more pleasing than when seen in the grass, among the shrubberies or along the fences. Eight or ten in a comparatively close group, here and there connected by others wider apart, and now and then several boldly showing themselves scattered still further apart and leaving the general group still further, is an effective way of planting. We attempt to avoid all regularity and give a perfectly natural appearance. When two kinds of bulbs are mixed together they frequently

give a pleasing effect. *Crocus* and *Hyacinths*, *Colchicums* and *Ixias*, *Narcissus* and *Arums*, losing themselves in each other, are very charming, while Poet's *Narcissus* and *Scilla campanulata* are fit companions amid the tall grass at their season of bloom. Some of the spring bulbs and rhizomes we use for this purpose, in addition to the above, are *Eranthis*, *Chionodoxa*, *Erythronium*, *Galanthus*, *Scilla* and *Claytonia*. Our method of planting is to force a crowbar into the soil, fill in one-half or one inch of previously prepared soil of about the consistency of that under the grass, place on the bulb, fill in with the same soil and step on it to complete the operation. Where the ground is well drained, leaf-mold is sometimes used, but the stiff, almost impervious, clay that abounds hereabout forms a small water-trap in almost every such instance, and consequently discourages this idea. In more thoroughly drained or lighter soils half an inch of leaf-mold or sand below the bulb would hasten root-growth.

Protecting for winter is now the main operation out-of-doors. Nearly all herbaceous plants have a covering of from five to eighteen inches of pine-needles. This is omitted when we

want to test the hardiness of any plant, and where large areas are taken up by one well-established and hardy species. But, even in the last instance, it does no harm, and often prevents plants from being lifted by the frosts, especially small and late-planted ones. October was exceptionally dry, so much so that the leaves of many shrubs and trees, instead of ripening and dropping as usual, shriveled and hung on to the last moment. A heavy rainfall two weeks ago and several warm and rainy days since have caused many buds to swell, and one Silver Maple is almost ready to burst into full bloom. This untimely forcing must exert a bad influence upon the plant and reduce its vitality. Where the weather becomes gradually and steadily colder, plants may be protected as soon as the average maximum temperature ranges between twenty-five and forty degrees, according to the individual subject. Covering too soon favors undue activity of the sap, and a sudden and very low drop in the temperature does the harm which a covering is used to prevent; its sole object being to insure a comparatively uniform temperature and avoid sudden changes from one extreme to the other, the proper time to apply it is when settled cold weather comes. Here at St. Louis, for instance, I have seen for several days at a time a summer temperature in January. Such weather, especially when preceded by a good heavy rain, tends to excite shallow-rooted plants into growth. Thus far it has not been advisable to protect Roses. Bedded-out bulbs have been mulched with an inch or two of decomposed horse-manure to encourage continuous root-action by preserving the warmth in the soil. In spring, after the bulbs are removed, this is dug in. In a few weeks, however, pine-needles serve as the real winter mulch. Last winter *Genista Andreana* died down to the snow-level where unprotected. *Magnolia foetida* and *Xanthoceras sorbifolia* usually have their branches tied together, and are then wrapped in burlapping or straw, always lightly to permit the air to freely circulate through the branches, but still keeping them as dark as possible. *Xanthoceras* does well here without any protection, but occasionally the plants die off mysteriously, like many Japanese plants. The southern *Magnolia* is a shy bloomer out-of-doors

here. When protected as above and allowing it to stand erect or bending down, and covered with Pine-needles, just as Grapes are sometimes protected, is the usual method of attending to this. If left unprotected during winter it drops its upper leaves under the warm spring sunshine.

Emil Mische.
St. Louis, Mo.

Spraying by Steam-power.

SINCE spraying against insect and fungous enemies of plants has come into practice, numerous devices have been used for applying liquid poisons to trees and plants, but not until recently has steam-power been tried to any extent. The hand and power pumps now in use answer fairly well for the orchard and garden, but the ravages of the Elm-leaf beetle make necessary the use of powerful pumps to spray the foliage of our giant Elms, for we must spray the Elms here at the north if we wish to preserve them. In the southern states, where the summer season is longer, defoliation, though enervating to the trees, does not kill them, because another

set of leaves is produced, while in this latitude (about forty-one degrees) trees do not come into leaf again, and complete defoliation for two seasons in succession kills them.

During July, in company with others, I visited the nurseries of Stephen Hoyt's Sons, at New Canaan, Connecticut, to inspect a steam-power spraying outfit, consisting of an ordinary steam engine of six-horse power and a double-acting force-pump, which, with a tank holding 250 gallons, are mounted on a platform wagon. Two lines of hose, each 100 feet long, and warranted to withstand a pressure of 200 pounds to the square inch, are attached to the pump.

A man among the branches of the tree draws up the hose with a stout cord, and fastens it to a limb, so that he is not obliged to support the weight of the hose filled with liquid. He is then in a position to direct the spray to all parts of the tree, two or three minutes at most being required to spray a large tree. The spray strikes the under surfaces of the leaves, where the insects usually feed. While two trees are being sprayed, men climb two adjacent trees, thus keeping the whole force well occupied.

There are many large old Elms on Mr. Hoyt's estate which have been sprayed for two seasons with this machinery; some with Paris green, others with "slug-shot," and all were in good leaf. Other trees close by which were not treated looked brown and dead, so complete was their defoliation. Mr. L. O. Howard finds arsenate of lead the best poison to use against the Elm-leaf beetle. By adding a little glucose to the solution it will adhere to the foliage for a long time. Though the pump and engine were not mounted upon a wagon at the time of our visit, Mr. Hoyt operated it for our benefit. Water was thrown in a perfect spray against the gable of a large barn between thirty and forty feet from the ground. Several different nozzles, including the Nixon, Vermorel, McGowen and graduated garden nozzle, were attached. Of these the McGowen was the most satisfactory in every particular.

The engine is used for many other purposes about the farm, such as cutting ensilage, sawing wood, threshing and other work where power is needed. During our visit we saw it utilized for unloading hay.

At present there seems to be an opening for a limited number of enterprising young men to take up spraying as a business. As it is, only the larger fruit-growers and gardeners can afford to equip themselves with elaborate and expensive machines, but there is a vastly greater class who would also spray if this could be done cheaply and in season. It would require but a small capital to procure an outfit for all kinds of work. But the man who takes up spraying as a business should possess a thorough knowledge of the use of insecticides and fungicides as well as an acquaintance with the life-histories of the insect and fungous enemies which he tries to combat. This information can easily be obtained from our agricultural colleges and experiment stations, and there is no reason why the spring and summer seasons, at least, might not be fully occupied in spraying trees and plants against the attacks of different insects and fungi.

Experiment Station, New Haven, Conn.

W. E. Britton.

Dipladenia Boliviensis.—The Dipladenias are not particularly free-flowering plants, but this species, although one of the smallest of the genus, flowers quite freely. It blooms when quite small, and it is rather a straggling shrub than a climber, and it makes graceful little plants when well cultivated. The leaves are leathery, shining green, oblong-acuminate, about three inches long. The flowers are produced in few-flowered terminal or axillary clusters, and measure three inches in length. The funnel-shaped five-lobed corolla is of the purest white, with a rich orange-yellow throat. Segments nearly trapeziform in outline, of a waxy texture. The flowers are produced sparingly throughout the summer and last long in perfection. This fine species will do well under ordinary greenhouse treatment in a rich fibrous soil and well-drained pots.

N. J. R.

Arbutus Unedo.—The Strawberry Tree, as this plant is often called on account of the slight resemblance of the fruit to a strawberry, is a native of the shores of the Mediterranean and the west of Ireland. Its principal claim to the attention of the gardeners of this country is its time of flowering, which is from the end of November to the middle of January, when it makes a very gorgeous display of its almost pure white nodding panicles of flowers. There is a large plant of it in the conservatories at the Botanic Garden in this city, which is yearly covered with bloom, but, curiously enough, although it has been there over twenty years it has never been known to bear fruit. This is probably owing to the absence of insects at that time of the

year. The fruit is quite as attractive as the flowers; the color is reddish yellow; size about an inch in diameter, covered with minute warty protuberances which give it a very fascinating appearance. A good-sized plant, grown in a tub, is quite an ornamental subject for outdoor decoration in summer, and few plants are found more useful for winter flowering in a cool greenhouse where there is abundance of head-room. Cuttings taken about this season root before spring in a cool house. The plants ought to be grown in soil containing a liberal quantity of peat and sand.

Botanic Garden, Washington, D. C.

G. W. O.

Correspondence.

Does Size Affect the Flavor and Color of Fruits?

To the Editor of GARDEN AND FOREST:

Sir,—It is generally believed by horticulturists that large size in fruits is attained at the expense of high color and fine flavor. Although this opinion is commonly accepted, it does not stand the test of philosophical reasoning or of a comparison of these merits in the various varieties of fruits. It is interesting to note that this opinion is probably the outcome of the theories of Goethe and St. Hilare, who maintained that every plant has a sum of activity, within which all variations must take place, and that a marked variation in one direction must be at the expense of some other part. It is now supposed that a plant can be made to vary progressively in all its parts, which means that vigor, size, fruitfulness, good color, etc., can be combined in the same individual.

It may be said further that a comparison of the quality and size of small varieties, with the same qualities in large varieties, cannot be made, because only those small varieties which have a special merit in their high color or fine flavor have been profitable to propagate, while hundreds of unprofitable small varieties have been thrown away. On the other hand, it may pay to propagate a large variety, because of its size, and consequently many such apples as the Ben Davis and Twenty One are grown, though both are inferior in flavor.

A study of the fruit catalogue of the Michigan Horticultural Society for 1894-95 gives opportunity to show proof that large size may coexist with fine flavor. In this list the fruits are described according to size, color and form and their special value for dessert, cooking and market, each quality being marked on a scale of ten.

There are thirty-two dessert apples which rank nine and ten, five of which are large, four medium to large, fifteen medium, four medium to small, three small and one undescribed. Of the two apricots, one is large and one very large. Of the seven best blackberries, six are large and one medium. Of the twelve cherries, six are large, two very large and four small; and a similar uneven relation exists in the other varieties of fruits described. The figures, therefore, seem to show that large size and fine flavor are entirely unrelated; that size and color are unrelated, and that a large proportion of the large apples and other fruits ranked nine and ten for dessert are both high-colored and fine-flavored.

Cornell University.

G. Harold Powell.

Notes from Brookline, Massachusetts.

To the Editor of GARDEN AND FOREST:

Sir,—During a recent visit to private gardens in Brookline, Massachusetts, I noticed in the fine collection of tropical plants belonging to Dr. C. G. Weld a beautiful specimen of the somewhat uncommon Pavetta Borbonica. This handsome plant has leaves opposite, lanceolate, dark glossy green, about one foot long, and dotted with spots of lighter green, and is useful for dinner-table decoration. It belongs to the Rubiaceæ, to which also belong the Ixora and the Cinchona, and is a native of the Isle of Bourbon. Dracæna Baptisti and D. magnifica are two handsome varieties of the bronzy leaved type, and are here represented by two well-grown specimens. There are also large specimens of Kentia Belmôreana, K. Fosteriana and K. australis. Curculigo recurvata, in the green and white variegated forms, is indispensable in any grouping of plants for effect. Broken into single crowns and potted into six-inch pots, it makes specimens of convenient size. It should be a valuable market plant when grown in this way. Its Palm-like growth and endurance of rough usage makes it valuable also as a house-plant. Its general appearance does not indicate its family relationship with the Amaryllids, but an examination of its six-parted yellow flowers and the position and structure of its seed capsule proves it. It is a native of the East Indies.

Among hard-wooded plants, otherwise known as Australian plants, there is here a grand specimen of *Acacia Drummondii*. Its long tassels of yellow flowers are borne in the axils of the palmately pinnate leaves near the ends of the branches. *A. cultriformis*, with knife-shaped phyllodia of glaucous hue, is represented by a large specimen which promises abundant bloom. The globular flowers are borne in bunches near the ends of the branches. In *A. heterophylla* the phyllodia are small and very dark green. This forms a handsome small bush, blooming quite freely for a foot or more along the stems.

The new hybrid *Streptocarpus* are becoming common, and their gloxinia-like flowers in blue and white shades are effective in small vases with a little green. An uncommon Aroid, *Nephthytis picturata*, is worthy of note, the white variegation of the leaves taking the form of a Fern-like frond.

At Mr. J. T. Gardiner's there is a choice collection of Cypripediums. All the varieties of the *C. insigne* type now in bloom are especially good in markings. I was too early to see *C. Sanderianum*, which is about to bloom for the first time in this country. *C. Chamberlainianum* was shown at the spring show in Boston, and is still flowering on the same spike. Eight blooms have opened, and three more buds are to come. The dorsal sepal is very light green in color; the petals are narrow, twisted, purple, spotted with brown. A neat little plant of *Asparagus deflexus* shows a comparatively new decumbent habit, and is apparently well suited for pillar or rafter work. *Cocos Weddelliana*, one of the most beautiful small Palms, is seldom seen so well grown as here. The Australian plants, which were the late Mr. Atkinson's pride, look uncommonly well under the care of Mr. Thatcher, who was Mr. Atkinson's assistant here for several years. *Genista Andreana* has recently been added to the collection. This handsome brown and yellow flowered Broom, from Normandy, makes a most effective plant for grouping. The Heaths in flower at the time of my visit in November were *Erica Cavendishii*, yellow; *E. Melanthera*, small pink flowers with black anthers, and *E. ventricosa*, pink, and the type of the closed corolla group. The Cherokee Rose, in a cool house overhanging a Lily tank, seems perfectly at home and promises an enormous crop of bloom, as also does the Yellow Jessamine of the southern United States, *Gelsemium sempervirens*. The collection of *Phalaenopsis* improves every year, and the plants are now the best to be seen anywhere. They include *P. Schilleriana*, *P. amabile* and *P. Stuartii*. They are grown at the warm end of a Cucumber-house, in moisture and heavy shade. The same conditions, with somewhat less shade, appear to suit a fine lot of *Eucharis Amazonica*, which promise to bloom well during the early spring months. In the cool Orchid-house, plants of *Odontoglossum Alexandrae* are bristling with flower-spikes, and a few are already in bloom.

T. D. Hatfield.

Wellesley, Mass.

Late-flowering Golden-rods.

To the Editor of GARDEN AND FOREST:

Sir,—I notice a reference to this subject on page 458. Here at Las Cruces, New Mexico, as late as November 15th, after some severe frosts, I was pleased to find *Solidago Canadensis* in flower, and got from it the last bees of the season, a male *Halictus pectoraloides* and a female *Halictus ligatus*.

Agricul. Expt. Station, Mesilla Park, N. M.

T. D. A. Cockerell.

Keeping Grapes through the Winter.

To the Editor of GARDEN AND FOREST:

Sir,—I have read the remarks in your issue of November 13th, regarding the keeping of grapes through the winter with great interest. The method you describe is hardly sufficient for our purposes without further precautions, on account of our warmer climate and the greater delicacy of most of our grapes. If kept in a dry place, with the precautions you mention, our grapes will keep till December or January, but by that time, if still sound, they become wilted and dried almost to raisins. In order, therefore, to keep them in a perfectly fresh state till spring or summer, they must be surrounded by a moist atmosphere; then the only difficulty to contend with is their liability to mold. The Agricultural Experiment Station of Berkeley is now experimenting on methods of preventing the development of molds without injury to the grapes. It is yet too soon to predict the results, but the indications are at present in favor of the use of alcoholic or sulphurous vapors. On the termination of the present series of experiments we hope to

be able to give more definite results for the guidance of growers.

Viticultural Department, Berkeley, Calif.

F. T. Biolletti.

Recent Publications.

Sir Dietrich Brandis contributes to the *Journal of the Linnaean Society of London* a systematic account of the Dipterocarpaceæ, a family of tropical Asiatic trees and shrubs, which he groups in five tribes, sixteen genera and three hundred and twenty-five species, although, in view of the imperfect knowledge of the vegetation of the Philippine Islands, portions of Borneo, Siam and New Guinea, the author believes that it is not unreasonable to suppose that not more than one-half, or, perhaps, two-thirds, of the members of the family are known.

An interesting peculiarity of the trees of the order is that several of the species are gregarious, forming sometimes nearly pure forests of great area in which one species has overmastered all other trees. In the tropical forests of south-eastern Asia the trees of this family play the part which in this country belongs to Pines and Oaks, Spruces and Firs. The most remarkable of the gregarious species is, perhaps, the Sal, *Shorea robusta*, the most valuable timber tree of northern India. This great tree forms pure, or nearly pure, forests at the foot of the Himalayas from the Punjab to Assam, and in a climate and soil which suit it no other tree can compete with it. This ascendancy Sir Dietrich ascribes to the fact that the seeds ripen at the commencement of the rainy season after the forest fires of the hot season have passed over the country. The seeds are produced in great abundance nearly every year, and germinate quickly. The leaves of the seedling plants are large, and are thus able to choke other seedlings which may spring up among them, and when the ground is burnt over by the jungle fires the following season the seedlings, or most of them, are strong enough to send up fresh shoots when the rains come. The young Sal, moreover, supports shade and will live for years under the dense shade of grass, bushes or other trees.

Sir Dietrich points out as a remarkable fact that two natural orders of woody plants, Coniferæ and Dipterocarpaceæ, whose species often form pure forests, produce resinous substances on a large scale in the leaves and deposit them in the wood, a complicated system of resin ducts being found in all parts of Dipterocarpaceæ as well as in Coniferæ. In the living tissue these substances are found only in a liquid and oily condition, but in the old wood solid crystalline masses are deposited.

One of the most important of recent contributions to dendrological science, this paper will be read with interest by botanists and foresters.

American Woods. By Romeyn B. Hough, Lowville, New York.

Part VI. of this interesting series, like its predecessors, contains sections of twenty-five different species of trees, with the botanical characteristics of each and notes on their properties and uses. All the trees represented in this volume are natives of our Pacific coast, and some of the sections, like those of the Madroña, the California Buckeye and the Mesquite, are of exceptional interest and beauty. We have so often spoken of this work as its successive volumes were issued that it is hardly necessary to repeat now that each species is represented by three very thin sections taken at different planes, one of these being described approximately as transverse, another radial and the third tangential to one of the annual cylinders of growth, so that a fair idea is presented of the color and grain of both the heart and sap wood of a given tree as they appear when cut at different angles. These specimens and the accompanying text have a real educational value. The sections are so attractive in appearance that they make an appropriate holiday gift for any bright boy or girl, and they will prove a source of unfailing pleasure to both the old and the young.

Notes.

Several trustworthy newspapers in this country and in England having announced the untimely death of Mr. George M. Dawson, a brief obituary note, based on this report, appeared in our last issue. We are more than pleased to learn that Mr. Dawson is still living, with the prospect of many useful and happy years before him.

Pierre Notting, one of the most successful of the French Rose growers and the originator of many of the best modern hybrid Perpetual Roses, died on the 2d of November, in his seventieth year.

Nature's Fashions in Lady's-slippers is a trim little book in stiff paper covers, published by Bradlee Whidden, of Boston, which contains six reproductions from photographs of our native Cypripediums, with a neatly printed page of text to accompany each picture.

Experiments have been made during ten years past with the different varieties of Dwarf Juneberries at the Iowa Experiment Station, and four of them which have borne the largest crops of the best fruit are now being sent out for trial. In size and quality these berries are said to compare favorably with large-bush huckleberries.

Very rarely does the flowering Dogwood develop such an abundance of fruit as it has this year in the neighborhood of this city. In Central Park, and more especially in the wildwoods in the upper end of Manhattan Island, where these trees are abundant, the bright scarlet berries—three or four of them together at the extremity of every branchlet—make them the most conspicuous feature in the foreground of every landscape.

We have heretofore spoken of the dwarf Sweet Pea, Cupid, which Mr. Burpee, of Philadelphia, has put on the market. It now appears that a Sweet Pea of similar character has originated in Germany and another in England. None of these plants have any tendency to climb. That similar sports should appear at the same time in different places is not uncommon. Indeed, this coincidence has been noticed so often that one is inclined to believe that it is in obedience to some natural law. It is only a few years ago that at least three non-climbing varieties of Lima Beans originated in different parts of this country at about the same time.

An interesting bulletin on Forestry has just been issued by Professor L. C. Corbett, of the South Dakota Experiment Station. Among the valuable trees not injured in that region by late spring frosts are noted the Wild Black Cherry, White Birch and White Elm, while the species most injured by frost are the European Larch, Black Walnut and Ash. The Wild Cherry is one of the most promising species on the station grounds, and only two trees are more highly recommended for general planting, namely, the White Elm and the Green Ash. Among conifers, Scotch Pine, Red Cedar and White Spruce are recommended in the order named.

Bulletin No. 94 from the New York Agricultural Experiment Station is really a little treatise on the feeding of plants, or, in other words, on the elements of agriculture. It contains 130 pages, and although it is scientific in the best sense of the word it is simple enough to be comprehended by any intelligent farmer. It is not a pamphlet to be hastily glanced over and thrown away, but one to be studied by all who want to know something of the constitution of plants, the chemistry of their foods, the practical way of preparing fertilizers for them, how to make the most of the materials on hand, and how to buy most cheaply the plant-food which cannot be had at home. The book contains many tables of permanent value and a first-rate index, which largely increases its usefulness as a book of reference.

The proportion of the apple supply exported is large enough to cause a scarcity of highest grades for home use, and choice King, Wine Sap and York Imperial now cost the retail buyer \$4.50 a barrel. During last week 22,378 barrels of apples were sent abroad from this port, while the receipts for domestic use comprised 38,596 barrels. Seedling and Navel oranges are now here from California, and moderate quantities of Florida oranges and grape-fruit from sections of the state which escaped the heavy freezes of last year. As much as \$7.00 a box is paid for Florida oranges by wholesale dealers, three times the price of a year ago. Muscat and Emperor grapes still come from California, the latter almost as brightly colored as Flame Tokays, which are now past. Persimmons, strawberries and tomatoes are also coming from the western coast.

The forests of eastern Asia are rich in *Lindera*, the genus to which the Spice-bush of our northern swamps belongs, and one of the species, *L. sericea*, is used for making toothpicks, which are acceptable on account of the toughness of the wood and their aromatic fragrance. According to the *Chemist and Druggist*, an English paper, a new perfume, *Kuromoji*, which is attaining some popularity among manufacturing perfumers, is the essential oil of this plant. It seems that the oil is not produced on a large scale by dealers, but by the small farmers of Japan, each of whom distills the yields of the shrubs growing on his own estate. These stocks are bought by dealers at various centres and mixed together, and therefore there is no uniformity in the aromatic qualities of the product. *L. sericea* is a small slender shrub, four or five feet high, and the oil is derived from the young shoots and leaves, and its balsamic odor is useful in perfuming soaps and other articles. It was introduced into Europe as long ago as 1889.

Of dried fruits California apricots alone are in light supply, but notwithstanding there is almost no foreign competition this year, prices have been unusually low, owing to excessive shipments to points throughout this country and for export. Wholesale dealers in this city are now offering evaporated apples of fancy grades at seven and a quarter cents, sun-dried eastern peaches at seven cents, cherries at ten cents, blackberries at four cents, huckleberries at six and a quarter cents, and raspberries at twenty cents a pound. Prunes sell for four to seven and three-quarter cents a pound, according to size, and apricots command thirteen and a half cents. Unpared California peaches bring eight and a half cents, the pared product being worth sixteen cents a pound. Since September 1st, 462,724 packages of dried fruits have been shipped to this market, 121,086 more than during the same period last year, and 168,426 packages have been exported, an increase of 90,391 packages over a year ago.

It is well known that the most delicate portion of an artichoke is what is called the "bottom," or, botanically, the receptacle from which the bracts spring. This receptacle in most artichokes is comparatively small and mixed up with the so-called "choke," by which name the pappus of the innermost florets is designated. In some varieties this receptacle, the fond d'artichaut, is thicker, more fleshy, and therefore more toothsome than in the ordinary sorts, showing that it has been developed at the expense of the succulent matter in the scales. In *The Gardener's Chronicle* for November 30th is a portrait of the Laon Artichoke, which shows a much larger receptacle and thinner scales than those we are accustomed to grow here. The writer of the text which accompanies this illustration speaks of a visit to the trial-grounds of Monsieur de Vilmorin, at Verrières, where this variety was growing among many others. The foliage is said to be distinct and handsome, with the bracts comparatively less succulent than in the ordinary varieties. It is cultivated to some extent in England as the Large Green Paris Artichoke. We have observed much difference in this vegetable as grown in this country, but we have never seen a head in which the receptacle was developed to such an extent as this illustration shows. Monsieur de Vilmorin states that this variety is not as early as others, but is the best for general purposes. It comes true from seed, but is best grown from offshoots. We should be glad to hear from any one who has grown the true Laon Artichoke in this country.

Robert Brown, who affixed to his name when writing upon botanical subjects *Campsteriensis*, to distinguish him from the other Robert Brown, died in London in October. He was born in Caithness, Scotland, in 1842, and received the degree of Doctor of Science from the University of Rostock, with a thesis on the North American species of *Thuya* and *Libocedrus*. From 1861 to 1866 Dr. Brown traveled in America from Venezuela and the West Indies to Alaska, visiting at this time the then little-known interior regions of Vancouver's Island and southern Oregon. As one of the results of this journey he published in the *Transactions of the Botanical Society of Edinburgh* a paper on some new and little-known species of Oaks from north-western America, which he had collected in Oregon; among them was the very distinct *Quercus Sadleriana*, which he first described in this paper, although it had been discovered by Jeffrey some years earlier. After his return to Europe, Dr. Brown became a lecturer on geology in Scotland, and then moved to London, where he produced a number of popular works of science. He is chiefly interesting to Americans as the author of the two papers we have already referred to, and of an incomplete work on the forests of North America, entitled *Horæ Sylvanae*.

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TABLE OF CONTENTS.

EDITORIAL ARTICLES:—Municipal Art	PAGE.	
The Pepper-tree. (With figure.)	501	
Some Notes on Timber-culture	502	
Vaccinium vacillans with White Fruit	Rev. E. J. Hill	503
FOREIGN CORRESPONDENCE:—London Letter	W. Watson	503
PLANT NOTES:—Chamædorea glaucifolia. (With figure.)	504	
CULTURAL DEPARTMENT:—The Selection of Carnation Cuttings	Lothrop Wight	506
Violet Notes	W. N. Craig	506
Seasonable Garden Notes	W. E. Endicott	507
Notes on Begonias	Robert Cameron	508
CORRESPONDENCE:—Schools of Horticulture	Louis Bevier	508
RECENT PUBLICATIONS	509	
NOTES	510	
ILLUSTRATIONS:—Branch of Pepper-tree, <i>Schinus Molle</i> , with berries, Fig. 69	505	
Chamædorea glaucifolia, Fig. 70	507	

Municipal Art.

IT has never been contended, so far as we know, that an election by the people to a municipal office entitles the successful candidate to be considered a master of liberal arts or an expert in the industrial arts. The man who is made city Comptroller by the Mayor, or Commissioner of Public Works, will hardly consider such an appointment equivalent to taking a degree in philosophy or the sciences, or in mechanical engineering. In regard to the foundations of a roadway or a bridge neither the Mayor nor the Comptroller would consider that his official position justified him in acting against the advice of a board of civil engineers, and even in some questions relating to the fine arts city officials have been known to manifest some hesitation before flouting the advice of men whose professional standing is recognized the world over. Thus, if a great public building were to be constructed, a mayor or a commissioner would probably consult an architect rather than attempt to devise a plan himself. On the other hand, park commissioners have often assumed to pass upon the artistic qualities of statues and memorials presented to the city and decide upon their location instead of referring these questions to some expert of taste and training, and last week four city officers and a representative of the Grand Army of the Republic used their positions to decide a critical question relating to the most important public monument ever erected in this city, in direct opposition to the carefully prepared counsel of every organized body of artists and art critics in this city.

Now, it is very evident that if New York is to have any municipal art worthy of the name we shall be indebted for it to artists. If there is ever to be anything like a well-considered scheme of decorative treatment for the city, any individual works or related series of works which will delight the eye and kindle the imagination, they will be created by artists. No one considers it the duty of the Comptroller or of the Recorder or the commander of the Grand Army of the Republic to design such works or to arrange them. No one would think of asking ex-officio advice of any of them on a matter of art. If in any special case they are clothed with final authority in matters of this

sort it is quite as plainly their duty to refer them to trained artists as it would be to refer a problem relating to public buildings to an architect, or a question of law to the Corporation Counsel. If it is argued that these men are in certain cases entrusted by law with the decisions of such matters, and that they must, therefore, act on their personal responsibility, we reply that their action is in the nature of a breach of trust if they do not decide according to the best possible light they can get on the subject, and every public officer ought to know where to look for such light.

The particular case to which we have alluded is this: The Legislature of this state appropriated a quarter of a million dollars for the erection of a memorial to the soldiers and sailors of the War for the Union, to be erected at some point designated by the Commissioners of Public Parks. Legally appointed trustees of this fund asked permission to erect the monument on the Plaza at the Fifth Avenue entrance of the park, and the Park Board, without consulting Mr. Vaux, their official adviser, at once granted it. Of course, this was a fundamental mistake, for since none of the trustees nor the Park Commissioners have had any such training as would give special weight to their opinion as to the location of a work of art, they should have at once asked for expert counsel. In some way the matter was at length brought before the National Sculpture Society, and this society, in connection with eight other associations, which together have organized a central body known as the Fine Arts Federation of this city, presented a report last week to the Monument Committee, in which another site is unanimously recommended. They took pains to give reasons why the Plaza was an improper place and why the point where Seventy-sixth Street and Riverside Park meet is in every way suitable. The Plaza is identified with the entrance of the park, and a lofty structure there will inevitably destroy the effect of the lower gateways which may in the future be built at this entrance. The plaza is low, and the proper place for a column or tower, such as is contemplated, should plainly be on higher ground. The monument should be on the axis of broad streets, instead of at one side of them, so that it could be viewed at long distances within the city. It should be at a point visible from the noble waterways which surround the city, where there is sufficient space for ceremonial displays, both military and naval, and certainly where it would not be dwarfed in stature as it would be on the plaza by the tall buildings around it. If the structure were set at the point recommended by the Fine Arts Federation it would be visible from the Hudson River as far north as Irvington; it could be seen from Staten Island and over the low grounds south of Jersey City as far away as Elizabeth, and the view from its summit would be magnificent. It would be a prominent object in the foreground to all who cross the proposed Hudson River bridge, and to every one who sails past it on the river. If placed at the southern end of the drive, with General Grant's tomb at the opposite extremity, the two could be connected by a series of monumental works which would add to the dignity of this noble parkway from end to end. These are a few of the points of this instructive report, but we think no one can read it through without feeling the convincing force of the array of arguments presented for the site recommended by the Fine Arts Federation, and yet of the six officials constituting the Monument Committee only one was willing to heed their counsel.

Now, all the members of this committee are public-spirited men, who are influenced solely, we do not doubt, by a desire to serve for the highest interests of the city. They are above any suspicion of vulgar self-seeking or other improper motive, and yet from lack of respect for expert advice their decision, if adhered to, will prove, as we firmly believe, a matter of regret to the people of the city for generations to come. If the artists are right in their view of this subject, the mistake will appear more and more serious as the years roll on. If the committee have any justifying reasons for their course which do not naturally

suggest themselves to the people of the city, they ought to be made public. This is a question in which every man, woman and child of New York is deeply interested. The arguments for the Riverside site have been plainly presented, and, so far as the reports of the meeting give any details of the discussion, no attempt was made to controvert them. Under the circumstances it is certainly due to the people that the committee should make some statement, setting forth their reasons for selecting the Plaza as the site for this memorial.

The Pepper-tree.

MUCH of the beauty of the streets and gardens of southern California is due to the presence of this South American and Mexican tree, the *Schinus Molle* of botanists, which Spanish priests carried to California when they established their first missions in upper California, and is now the most commonly planted shade and ornamental tree in all the region south of the Bay of San Francisco.

Schinus Molle is an aromatic tree of the family to which our Sumachs belong, with a short stout trunk covered with dark furrowed bark, a low broad head of graceful pendulous branches, light bright green persistent leaves, composed of twenty or more pairs of small leaflets, minute dioecious yellow-green flowers in large open panicles, and bright red fragrant fruit, the size of small peas, hanging in ample clusters. Our illustration on page 505 of this issue shows one of the clusters of fruit with some leaves of this tree which is now so much at home in California, and is such a conspicuous feature of the southern California landscape that travelers from the east who are not botanists usually regard it as a native of the soil and the typical California tree—an excusable error, for it has been planted in all the southern towns much more frequently than any of the native trees.

Schinus Molle is an excellent street-tree for dry arid regions, and it seems to flourish without water and to go on producing its bright green foliage and its flowers and fruit without much regard to the seasons. In wet weather the leaves emit a pungent balsamic odor, due to the resin glands with which they abound, and which, when the leaves are placed in water, burst, giving them an apparently spontaneous movement.

In Chili, Molina tells us, in his *Saggio sulla storia naturale de Chili*, a kind of red wine of agreeable flavor, but very heating, is prepared from the berries; and from the bark a dye of the color of burned coffee is obtained, which in his time was used in Valparaiso to stain fish nets.

Some Notes on Timber-culture.

DURING the summer and fall of 1895 I was enabled to examine a number of the timber plantings in central Kansas, especially in McPherson County, where a comparatively large number of timber-claims were taken. A reasonably fair proportion of the land-titles were perfected here under the provisions of the Timber-culture act; though, as has been noted before, the ratio of titles perfected to claims filed under this act has been sorrowfully small. At present most of the plantings have attained an age of twenty years or over, and something like a fair judgment of results is possible.

In one timber-claim of the most recent planting which I visited, the entire required ten acres are set in Osage Orange; and although the land is not really good and the location in all respects unfavorable, the stand is almost perfect and the young trees present a decidedly thrifty appearance. Though the average height would certainly be less than eighteen feet, the trees are straight in trunk and uniform throughout. The trees, originally set four feet apart each way, according to the law, are now ready for thinning. Each alternate tree might properly be removed, and each would make a good vineyard stake. Osage Orange also compares very advantageously with adjacent trees of other

species in another timber-claim which I examined, and where the plantings were made longer ago under the old law which required trees to be twelve feet apart each way. Many of the trees here would make moderately good fence-posts, though the trunks are by no means so straight and uniform as in the block planted four feet apart. The advantage of planting close at first is abundantly indicated by a comparison of these two blocks.

Black Walnut appeared in considerable quantity in three of the claims examined. In all cases it commends itself to those who yet wish to plant trees in that section. I was able also to compare plantings of this tree made twelve feet apart with others made closer, but, unlike the Osage Orange, the Walnut seems to have done better when widely set. This apparent discrepancy, however, I suspect, is due to the fact that the closer plantings were not duly thinned. In both the cases of thick planting which I noted, the stage at which thinning should have begun has long been passed. I observed a marked decline in vegetative vigor in the crowded trees as compared with those near by which had more room. A slight difference of moisture supply and depth of soil occurring within a few feet had also caused a most remarkable difference in growth among the crowded Walnuts, showing how seriously the young trees were exhausting their food-supply. The Walnut-trees in this section of country have withstood the inclemencies of heat and drought and wind in a very creditable fashion; and the posts and stakes now available from them make them as valuable probably as any other species. It is also worth while to remark that these trees have been bearing fair crops of nuts since they became about ten years of age. The great numbers of tent-caterpillars' nets in the tree-tops during summer and fall make them often unsightly, and are otherwise a serious matter.

Cottonwoods were extensively planted all over the section visited. They probably made a large majority of all the trees set in timber-claims, shelter-belts and plantings of all sorts whatsoever, for the early Kansas planter took little thought for the selection of any variety for any special purpose. A tree was a tree, and the faster it would grow the better he liked it; and nothing grew faster than the Cottonwood. The showings made on prairie farms in a few years were always surprising, but the time has already been long enough to demonstrate plainly the weak points of the Cottonwood. In all upland plantings the once thrifty trees are already decimated, and the survivors are hurrying to premature decay. In some places where, a few years ago, Cottonwoods monopolized many acres, there is not now a tree, and the land is cultivated annually for wheat or corn. I examined two timber-claims on bottom-ground where Cottonwoods had been chiefly planted, and in these the stand was good and the trees large, straight and apparently thrifty. Tree beside tree stood forty or fifty feet tall, with straight clean trunk; but it must be borne in mind that their value for almost any purpose is not to be compared with that of the Osage Orange or Walnut. In both plantings mentioned above a part of the respective blocks ran up onto higher ground, and here the desolation was as perfect as in upland-tree claims and much more marked from its proximity to the better growth. At Garden City, Finney County, Kansas, where the Cottonwood-trees wet their feet in the irrigating ditches, the growth is enormous and the promise brighter. Those who have seen the older irrigated Cottonwoods at Denver and Greeley, Colorado, and at Salt Lake City will know what magnificent trees may be grown in a decade or two.

Box-elders, *Acer Negundo*, were also freely planted in timber-claims and shelter-belts on account of their ease of propagation. But their story is the same as that of the Cottonwood, except that they never did amount to anything. They have succumbed by thousands to the recent protracted droughts, and dead and misshapen trees now disfigure the landscape everywhere. Grown on upland the tree never makes either posts, stakes or firewood.

Catalpa speciosa was extensively planted, but in all

plantings which I have seen, all on upland, it has not fulfilled the promises made for it. Even when planted close and well treated, the small trunks are crooked and soon divide into useless branches. Ailanthus has done much better, for it makes a rapid growth and a straight unbranched trunk. Within a very few years it makes comparatively good fence-stakes. It seems also to be tolerably strong in drought-resistance, though there is little promise that the trees on Kansas upland will ever come to the perfection of the old Ailanthus-trees about the Temple Square, in Salt Lake, where the rows are closely paralleled by ditches of flowing water.

Black Locust made a good growth on these prairie claims, but has been almost completely cleared away by borers. Many other species were planted, but none in great quantities, and there are none which have gained enough of reputation to justify their exclusive use in future plantings.

Manhattan, Kansas.

F. A. Waugh.

Vaccinium vacillans with White Fruit.

A VARIETY of this Low Blueberry with light-colored fruit was found last summer in the sand region east of Chicago. When growing in the shade the berries were white or faintly tinged with red, but in the bright sunlight they became flesh-colored or rosy on the exposed side. Their shape was obovate or pyriform, so that they differ from the common form, which is usually globular or depressed globose. They were very sweet and juicy and in quality superior to the average product of the Low Blueberry, for it varies considerably, being sometimes large and juicy, like the fruit of *Vaccinium Pennsylvanicum* and *V. Canadense*, but ordinarily smaller and drier. The leaves were also smaller than usual, and were broad oval to roundish in outline. These distinctions, if they remain constant, show a well-marked variety.

The bushes were very prolific in fruit and covered an area about three rods long by eight or ten feet to a rod in width. Nearly every bush was bearing, and none of the ordinary form was found mixed with them. Assuming that they all were derived from a single sport of the typical plant, the stoloniferous habit of *Vaccinium vacillans* would easily account for the number of plants found together, if they do not come true from seed. Many of the *Vacciniums* spread extensively by means of subterranean stems. I have traced those of the Low Blueberry several feet in the loose sand. These underground stems emit many fibrous roots, especially at the joints, and occasional branches. Those rising above ground grow into the ordinary shrub; hence an individual plant may be made up of the parts underground and several aerial stems.

By inquiring I learned from the berry-pickers that they were well acquainted with these white-fruited bushes. Two other patches, at least, were mentioned, but they were said to be found more frequently as single bushes, or two or three in company. From this I think it quite probable that the seed is fertile and that the variety is disseminated in this way.

Though albinism has been observed in the fruit of various species of *Vaccinium* in this country and in Europe, and also in the Black Huckleberry, *Gaylussacia resinosa*, I can find no case on record for *V. vacillans*. White huckleberries being also caused by a fungus (*Sclerotinia baccarum*), these berries were carefully examined for fungoid growths. None were found in them, nor any on the bushes that could have affected the fruit in such a way. As a whole, they were remarkably healthy-looking plants, some root swellings only being noticed in one or two plants that were apparently due to a fungus. The fruit was so pure in color and the skin so thin that it was almost translucent when fully ripe, and has become fully so in some specimens preserved in salycilic acid. Professor Porter has also mentioned the translucency of the white berries of *V. Pennsylvanicum*, and of alcoholic specimens of the white fruit of *Gaylussacia resinosa*.

Chicago, Ill.

E. J. Hill.

Foreign Correspondence.

London Letter.

NEW GARDEN PLANTS, 1894.—The list of new plants for 1894, which forms Appendix II. of the *Kew Bulletin*, has just been issued; price, fourpence. It contains short descriptions of each, with references to the original description and figures of nearly five hundred plants introduced into cultivation during the past year. It is unnecessary to point out the value such a list must have for botanists as well as horticulturists, as it includes not only all the species but all varieties as well, with botanical names, and all true hybrids with their parents. A few of the plants included are old and forgotten garden plants reintroduced. The list is compiled from all botanical and horticultural publications in Europe and America in which new plants are known to be recorded. A similar list for each year has been prepared annually at Kew, and published as an appendix to the *Bulletin* since 1887. The bulk of the new plants of 1894 are Orchids, and as evidence of the activity of the hybridist, it is noteworthy that no less than thirty-eight hybrid Cypripediums and twenty-two hybrid Lælias and Cattleyas were flowered for the first time and given prominent notice last year.

PICTURESQUE SCENERY AT KEW.—Artists and photographers are fully alive to the beauties of Kew scenery, and numbers of them may be seen at work at any time of the year, in the morning as well as the afternoon. For the last two years two eminent artists, Monsieur and Madame de L'Aubinière, have been engaged in painting pictures of the scenery about the lake in the gardens. Their pictures, nearly one hundred in number, are now on exhibition in a room adjoining the "North" gallery, where they are a source of gratification to visitors. The lake in the Royal Gardens was made about forty years ago by Sir William Hooker. It is an irregular piece of water with three small wooded islands, and is fed by the river Thames. The pinetum extends along its south side, and its margin is broken by a collection of Willows and Alders. The beauty of the views to be obtained from various points is well shown in the pictures above mentioned. Many of these views have lately been opened up by the judicious removal of superfluous trees and shrubs.

IDRIA COLUMNARIA.—Can some correspondent in Lower California give us some information with regard to this plant? I lately saw a picture of it in an American publication (I forget which), representing a plant with a thick Cactus-like or sugar-loaf shaped stem, bearing a few short branches, with leaves and flowers at the top. Inquiries in America elicited no information, except that the plant was in some inaccessible region in Lower California. I learn from Dr. Masters, however, that a plant of it has lately been added to the collection in the Jardin des Plantes, Paris, where he saw it a few weeks ago. He describes it as having a stem two to three feet high, and as much through at the base, with slender branches near the top, and ovate acute leaves. Idria is supposed to be related to the genus *Fouquiera*, of which *F. splendens* is in cultivation here. Living examples of the Idria would be greatly valued at Kew. What the Frenchmen in California appear to have done for Paris surely can be done by an Englishman or American for Kew.

CATASETUM IMPERIALE.—This is one of the series of large handsome-flowered Catasetums introduced last year by *L'Horticulture Internationale*, and to which I have already referred. Mr. Rolfe considers them all to be natural hybrids, between *C. Bungeothii* and *C. macrocarpum*, but they show a most extraordinary diversity both of form and color, some being exactly like *C. Bungeothii* in form, and to this lot belongs that now under notice, of which a plant bearing a nine-flowered scape was shown last Tuesday and easily obtained a first-class certificate. Each flower was three inches across, the sepals and petals in a cluster above the large shell-shaped lip, and the color cream-

yellow, with blotches of claret-purple. Is it possible that *C. Bungerothii* is a very variable species, or that from some cause or other the plants of it in one locality have sported freely? Whatever their origin there can be but one opinion as to their horticultural value, and I endorse the opinion of *The Gardeners' Chronicle*, that this *C. imperiale*, as shown last Tuesday, is the most gorgeous *Catasetum* known. I may remark here that *Catasetums* may be propagated from pieces of the pseudo-bulb.

DENDROBIM SUBCLAUSUM.—Mr. Rolfe described this as a new species in the *Kew Bulletin* last year (p. 361) from a plant flowered by Messrs. J. Veitch & Sons in July, and introduced by them from the Moluccas. It was shown by them at the meeting of the Royal Horticultural Society on Tuesday last and received a botanical certificate. It has erect slender-branched pseudo-bulbs, forming a close cluster two feet high, clothed with linear lanceolate bright green leaves two inches long. The flowers are borne on the leafless pseudo-bulbs in short axillary few-flowered racemes; they are an inch long, shaped like the flowers of *Dendrobium longicornu*, but narrower and colored brilliant cinnabar-orange, the pedicels also being colored. The lip is peculiar in being folded in at the apex and almost inclosing the column. It is a remarkable and attractive plant and is sure to be made to serve the purpose of the hybridist, the color of the flowers being exceptional in this genus.

LÆLIO-CATTLEYA INGRAMI is a beautiful hybrid which was raised by Mr. C. N. L. Ingram, in 1892, from *Lælia pumila* Dayana and *C. aurea*, and which is now in the collection of Sir F. Wigan, at Sheen, who paid fifty guineas for it. Flowers of it were exhibited last Tuesday. In size, color and general form it resembles the *Lælia* except in the label-lum, which shows a good deal of the influence of the *Cattleya*. It is one of the most beautiful of the *Lælio-Cattleya* hybrids, and I learn from Sir F. Wigan's Orchid grower that it is easily kept in health.

ARUNDINA PHILIPPPI, a supposed new species, was shown in flower on Tuesday by Sir Trevor Lawrence. I should call it a narrow-leaved, small-flowered variety of the well-known *A. bambusæfolia*; the flowers are about one and a half inches across, and colored pale lavender with a crimson blotch on the lip. It was awarded a botanical certificate.

CYPripedium PLATYCOLOR is a new hybrid between *C. concolor* and *C. Stonei platyœnum*, the name being hybrid also. It originated in the collection of Sir Trevor Lawrence, who showed it in flower on Tuesday last. In general characters it resembles *C. concolor* (concolor \times Lawrencianum), but the flowers show the influence of *C. Stonei*. The scape bore three flowers and a bud.

BEGONIA FRÖBELII.—This species was introduced by the Zurich nurseryman, after whom it was named, about twenty years ago, when Roezl discovered it in Ecuador. Hitherto, however, it has found little favor as a garden plant, probably because it has refused to grow satisfactorily under the treatment which suits the ordinary tuberous Begonia. A near ally is *B. polypetala*, a Peruvian species, introduced in 1878 and in 1880. Messrs. Fröbel distributed a hybrid they had raised between these two, and named *B. Fröbelii incomparabilis*. Mr. Poë, of Cheshunt, exhibited this week a plant of this hybrid which literally staggered most of the cultivators who saw it, for it is undoubtedly one of the most beautiful of all winter-flowering Begonias. The plant was in a six-inch pot, and it bore about a dozen leaves, the largest of which measured eighteen inches in length and thirteen in width. The scapes, of which there were eight, were stout, erect, two feet high, branched, and bearing numerous flowers and buds, the former two inches across and colored bright orange scarlet. Mr. Poë grows the plants in a warm greenhouse, starting them along with *B. Socotrana* in August. They flower all through the winter. I should place this Begonia in the same rank as the *Socotrana* hybrids as a garden plant.

NEW CHRYSANTHEMUMS.—There were several exceptionally good varieties among the new seedlings exhibited for cer-

tificates last Tuesday; they are *Country of Gold*, a very free-flowering, bright yellow reflexed variety, likely to prove of great service for the supply of cut flowers for market; *Bonnie Dundee*, a well-formed incurved variety after the style of *Lord Brook*, but yellower; *Oceana*, large as and shaped like *Vivian Morel*, but of a much more pleasing pinkish color; *William Slogrove*, a magnificent incurved Japanese, almost a true incurved, the flowers large, full and colored deep golden-yellow; this was generally pronounced to be one of the best of this year's productions. Sir Trevor Lawrence is a large incurved, very like *Queen of England*; and *Golden Dart*, a yellow-flowered Japanese variety of medium size, was certificated as a free and useful plant for the market-grower. We are still busy with exhibitions of Chrysanthemums, the National Society having a three days' show at the Aquarium next week. The mild, foggy and wet weather of the last few days has, however, shortened the lives of many of the flowers.

London.

W. Watson.

Plant Notes.

Chamædorea glaucifolia.

THE *Chamædoreas* are very graceful and beautiful Palms, natives of South America. They are shade-loving plants, growing in the depth of dense woods where hardly ever a ray of sunshine penetrates. They are generally small and slender, with elegant pinnate leaves and dioecious flowers; some are climbers, supporting themselves by means of hooked tendrils at the end of the leaves. The above species (see figure 70, page 507) is one of the most beautiful of the genus, a native of Guatemala, and accustomed to a moderate temperature. It grows to a height of twelve feet or more, with a slender ringed stem about as thick as an ordinary walking-stick, or in strong specimens an inch or an inch and a half in diameter. The leaves are pinnate, of a pleasing glaucous-green, four to six feet in length, with long arching pinnae. The species flowers quite freely under cultivation, male and female flowers being produced on different plants. The large erect inflorescence rises from the axil of a leaf above the foliage, and renders the plant quite picturesque. The flowers are greenish yellow, with three fleshy petals. The female plants are most common in gardens.

In greenhouses it thrives well in the deepest shade and in a temperature of seventy degrees. It remains a convenient size for years, and is, therefore, well adapted as a decorative plant for a dwelling-house. It is strange that these interesting miniature Palms, of which seeds must be easy to obtain, should not force the larger and coarser forms into the background.

CLADRASTIS LUTEA.—This tree, known in cultivation as the *Virgilia*, and in the region of which it is a native as the *Yellow-wood*, is one of the rarest trees of the North American forests, being found in a few isolated places in central Kentucky, central Tennessee and the western slopes of the high mountains of east Tennessee and in Cherokee County, North Carolina. Like many other trees of restricted range, it thrives under cultivation in widely different soils and climates. This southern tree is perfectly hardy in New England, and ripens its wood in exposed situations in Canada without any artificial protection. Even in the mid-western states it flourishes as far north as Iowa, where many of the forest trees and shrubs of New England fail to endure the heat and drought of summer and the cold of winter. At its best it attains a height of sixty feet, with a trunk two feet in diameter, while in exceptional cases it is still larger. It usually divides into two or three main limbs not far from the ground, which spread widely and ramify into slender and somewhat pendulous branchlets, forming a broad and graceful head. At this season it is a beautiful object, the bark of its trunk being silvery gray and of a smooth, fine texture, that on the main branches a lighter ash color, and the lustrous red-brown

spray is as refined and delicate as that of the American Beech. The leaves appear early in spring and are of a light, cheerful green, turning to a clean uniform yellow in autumn. The white, fragrant pea-shaped flowers hang in panicles a foot or more in length, so that all the year through it is one of the very best of what are known as lawn trees. One objection to it is that when the limbs are weighted



Fig. 69.—Branch of Pepper-tree, *Schinus Molle*, with berries.—See page 502.

with ice in winter they sometimes break off or the trunk splits apart. A fine specimen (figured on page 92 of vol. i.) split at the fork some years ago, but the limbs were drawn together and an iron rod bolted through them, and no trace of the disaster now remains. It should be said, too, that the tree only flowers abundantly on alternate years, although there are some flowers every year.

CANNA, JOHN WHITE.—The interest excited by the introduction of the dwarf French Canna, Madame Crozy, has led to the raising and introduction of many new forms, varying much in the size and color of the flowers and less in the form and color of the foliage. As the hybrids bear seeds very freely, which are easily and quickly grown into flowering plants, the natural result is a surfeit of named and unnamed kinds, with flowers mostly in shades of reds and yellows, or a mixture of these colors. We have not had varieties with very striking differences of foliage, the leaves being usually of varying shades of green, or with red or bronzy suffusions of a rather dull character. Variegated forms there have been, with more or less white margins to the leaves, but these markings have not been so effective as to render the plants especially striking in the garden. As usually happens when a plant is harassed by cultivators, the Canna seems to have taken a new departure also. Among a lot of seedlings from the best dwarf varieties grown by John White, of Elizabeth, New Jersey, in 1894, there appeared a plant with a novel color in the foliage, and this, carefully saved and grown, has since been tested in the open and under glass. The plant attains a height of three feet, and the foliage is of the ordinary type, but very curiously and attractively colored. The young leaves are of a pale yellow, with narrow margins of dark red, and as they advance there appears some suffusion of light green, mostly in spots or dashes. The leaves retain this color till they gradually mature by losing the yellow and gaining a deep suffusion of pink with an admixture of green. The plant in this condition is decidedly striking and novel, the general color-effect being decidedly pink. The plant is said to have held its color perfectly under the sunlight this season, and it would appear that we have in this variety not only a new departure, but a first-rate, showy foliage plant for decorative effects in the garden. The flowers are small, of a deep scarlet and of no value, but the ovaries, which are dark red, seem to be more persistent and decorative than usual to this plant.

BEGONIA ACUMINATA.—This is another valuable winter-flowering shrubby Begonia. The leaves are not more than two or two and a half inches long, very thick and fleshy, with coarse hairy veins and coarsely toothed. The color is a deep olive-green, tinted red below. The flowers measure over an inch across, generally pale flesh-colored, but sometimes white. In the female flowers the petals are narrow, ovate-acuminate; in the male flowers they are broader. The loose few-flowered cymes are borne abundantly from the axils of the upper leaves. The stem is stout, erect and fleshy, growing to a height of a foot or more. The plant is generally bushy and covered with a profusion of flowers during the early winter months.

It is a West Indian species of great merit, but not very common in cultivation at the present time.

IMPATIENS SULTANI VIOLENCEA.—This very floriferous plant, like other varieties of this species, is an excellent winter-flowering kind, easy of culture and satisfactory when well grown. The flowers are fully an inch across and of a roundish outline and bright rosy pink. There are numerous

varieties and hybrids lately raised and introduced by German seedsmen, of more or less dwarfish habit, and varying from white to flesh color, salmon-rose and the deeper shades of pink and crimson. *Impatiens Sultani* may be grown from cuttings, which can be rooted with ease at any time of the year, or by means of seeds, which grow readily. To form nice winter-flowering specimens the seeds should be sown early in spring, singly, in two-inch pots in rich fibrous soil. The young plants require plenty of light and should be grown in a warm greenhouse as close to the glass as practicable.

CENTROPOGON LUCYANUS.—Showy in color and graceful in habit, this stove-perennial of the Campanula family is one of our best winter-flowering plants. It is a garden hybrid, raised by the French horticulturist, Monsieur Desponds, between *Centropogon fastuosus* and *Siphocampylus betulæfolius*. The flowers are curved, tubular, about two inches long, with recurved segments and a very prominent hairy stigma longer than the corolla; color, bright rosy-carmine. They are produced several together on short side-shoots, and when the plant is in full bloom it is very attractive. The leaves are ovate or oblong-lanceolate, serrated, smooth, dull green; stem slender, growing to the height of four or five feet, and herbaceous. This is a plant for the warm greenhouse; it should be grown in a half-shady position in well-drained pots, in a mixture of rich loam, leaf-mold and sand, with an addition of some well-rotted horse-manure. During the growing season too much water cannot be given. Old plants may also be planted out in the open air in a moist and half-shady position, where it will grow rapidly and form numerous side-shoots. As the flowering during winter depends upon these, the plants should, of course, not be pruned until after it flowers, when they can be dried off slightly and cut down to the ground before being planted out. Plants treated in this way should be lifted early and potted in moderately sized pots. They may also be planted out in a border in the conservatory, where they can be left for years. For ordinary use small plants raised by means of herbaceous cuttings in spring and grown on as rapidly as possible are the best. These will reach a considerable size during the first season, and if grown in pots should be gradually ripened as winter draws near. As this is one of the best plants of its class and suitable for all kinds of winter decoration, it is surprising that no enterprising florist has taken it in hand long before this.

Cultural Department.

The Selection of Carnation Cuttings.

THE importance of selecting strong stock from which cuttings are taken if we are to have good plants, is set forth in an article by Mr. Lothrop Wight in a late number of the *Florists' Exchange*, from which we take the following points:

Individual plants, decidedly better than their neighbors, should be marked and cuttings from them kept by themselves. This is not to improve the type, but to help keep the stock up to the standard, as plants selected from cuttings at random will show deterioration. Cuttings taken from plants on the outside rows of the benches where the shoots are fully exposed to the light will be larger and more stocky than those taken from the inner rows. Cuttings will generally be at their best when the flower is fully open, and no cuttings should be taken from a stem which does not have a flower at the end of it. Some varieties give three or four good cuttings to a stem, and where the stock is limited there is no objection to taking every cutting on the plant, leaving only enough to keep up a supply of flowering shoots. Every available cutting should be taken from plants which show unusual vigor of growth, for the exceptional vigor of the plant extends to all its parts and even to the smaller stems. If set in flats, cuttings can be moved into the sun as they begin to root, for as soon as they are rooted they are plants and should not be kept in sand and shade, which are both unsuitable to plant-growth. Therefore they should be taken out of the sand and put in the sun as soon as possible. Bottom-heat is unnecessary, the usual

temperature of a Carnation-house being about right. Where cuttings are grown for the trade bottom-heat is an advantage, because they root more quickly and evenly, but it is questionable if they make as good plants, and when quality is the point sought rather than quantity late-struck cuttings are all right. For abundant bloom large plants from early-struck cuttings are essential.

Violet Notes.

THE remarkably open weather which prevailed until the early part of December has made Violets bloom with unusual freedom. I do not recollect to have gathered so many flowers to the plant for several years as I have during October and November just past. Severe weather and heavy snowfalls are, however, likely to come at any time, and frames should by this time be well protected to resist such changes. Dry leaves packed around the sides, with a slanting board laid over them to throw off water will prevent frost from penetrating the sides, while mats and shutters which project two or three inches over the top and bottom of the sashes are used for top-covering. Plants in frames require a great deal of attention during the dark winter months, and light and air must be given on every possible opportunity. It does no harm to leave the frames covered with snow for a couple of days in severe weather, but great damage is done if snow is allowed to remain for a week, when mold will spread with alarming rapidity. Even if sunlight can be admitted for but three hours and a little ventilation given, it is surprising how the plants are benefited. There are very few days during the whole winter when we do not give both light and air. Violets resent coddling, and air should be given freely whenever the outside temperature allows. If the thermometer registers several degrees below freezing, even in midwinter, the sun warms the frames sufficiently to permit a moderate amount of air being admitted. Violets in frames make much more work than when they are grown in houses, and the flowers are less convenient to pick, but the quality of blooms is as good in all kinds, and much better in some, particularly the single varieties; the flowering season, too, is a little longer than with those grown in artificial heat.

It is well to look over the plants every week and remove runners, decaying leaves and all signs of mold. When water is required, the forenoon of a bright day should be selected and care taken to wet the foliage as little as possible; tepid water ought to be used. The diseases known as spot and leaf-curl still continue to wipe out batches of promising plants. The real cause of these diseases are still unknown, and we have no certain remedy for them. One day the plants look thrifty, the next day a few spots appear; those affected may be picked off, but probably within two weeks the whole stock is an eyesore and fit for the rubbish heap. A neighboring florist, who for several years had grown splendid crops of Marie Louise, had, four weeks ago, the finest house of this kind I ever saw, with not a sign of disease anywhere on his place. His plants had every possible attention and promised a splendid harvest of bloom for the winter; three weeks later I saw the same house and there was hardly a single healthy leaf, and every plant had to be thrown out. The grower of these plants told me that during a spell of sunless weather in November the whole work of destruction was done within a week.

Where it is well grown, Marie Louise must still take rank as the best Violet grown; very few, however, have clean stock of it in this section. The way this and other varieties are grown by Mr. A. McKay, of South Framingham, Massachusetts, is an object-lesson to those who have never seen Violets as he grows them. Last year he had flowers of Marie Louise which covered a silver dollar, and this season his stock of this variety, as well as Farquhar, Swanley White and Lady Hume Campbell, is superb, and promises to beat last year's record. We recently received some blooms of the new variety Farquhar from a friend on Cape Cod; they averaged as large as a half-dollar, and some were slightly larger; for so early in the season these were exceptionally fine, and the stems were seven to eight inches in length. This variety promises to be a useful one; in color it is identical with Marie Louise. Lady Hume Campbell is probably more grown than any other double variety. Last year our plants in frames gave hardly any flowers until the end of February; this season they have been blooming finely for the past six weeks. Although a good deal paler than Marie Louise in color, its many good qualities commend it to nearly all who have grown it. It is not disease-proof by any means, as we have seen whole houses of it wiped out, but, taken all in all, it is the cleanest of the double ones we have grown, and many who have failed to make a success

of other kinds now rely on it exclusively. The flowers are of good size and are produced on fine stems.

Among single varieties the new California makes the most rampant growth and flowers quite freely, occasionally two and three flower-buds appearing on a stem. For length of stem the introduction from the Pacific coast must take first honors, and in this respect it is all that the introducers claimed. Its fragrance is fine and flower of good size, although a long way from covering a silver dollar as yet. In color, however, we have failed to see the "deep violet-purple," and the flower lacks the substance of other single varieties. We have seen this variety growing in a number of places, and few of the

Seasonable Garden Notes.

THE generally mild weather which has so far prevailed has enabled cultivators to lift tender bulbs and to plant the hardy ones with less trouble and anxiety than last year, when a heavy snowstorm on November 6th found the bulbs of Dahlias and Gladioli and others in the earth, where many of them died, and many sorts, especially Irises and Ixias, still in boxes and bogs. I always delay planting Ixias until the last moment, because they are more inclined than most things to make an autumnal growth, and this year planted them November 30th. The past season has been a good one on the whole,



Fig. 70.—*Chamaedorea glaucifolia*. a. Part of inflorescence.—See page 504.

growers were favorably impressed with it. At the end of the flowering season we can, however, better estimate its value. Wellsiana must take rank as the finest of the dark single kinds; this variety and The Czar both succeed better in frames than in heated structures. The former makes very few runners, and requires to be propagated by cuttings inserted in sand. The flower is larger and darker in color than The Czar. It produces much smaller foliage, however, and as the older variety has an abundance of good-sized leaves, it is specially useful during the winter season, when it is sometimes as difficult to get a sufficiency of these as of flowers.

W. N. Craig.

Taunton, Mass.

especially so far as increase of bulbs is concerned. Some months ago I wrote that I thought a Gladiolus seedling of the present year would blossom soon. It did so in October, and, although the variety was exceedingly poor, I was glad to beat the record, for, so far as I know, this is the first instance of an early flowering. The new *Tigridia alba immaculata* is a beautiful flower, well worthy the attention of growers of bulbous plants; it is, at least with me, a stronger grower than the older white variety. I am not sure that it is more beautiful, but it is different, and gives variety. Though unspotted, the white shades, in parts of the centre, to a creamy tint. *T. violacea* is a small-flowered kind, but pretty.

Two plants are offered for sale as *Ophiopogon spicatus variegatus*. One of these is the true species, with spikes of beautiful purple or violet flowers of long duration, followed by numerous ornamental, bright blue berries; but what is the other plant which produces white flowers in clusters of two or three along a central spike, the spike and flowers both drooping, and white oblong berries? *Tulbaghia violacea* is a good pot-plant, flowering six or seven times a year. Its flowers are of a tint somewhat redder than its name implies. It gives satisfaction planted out in the summer, but care must be taken in lifting it, or all of the winter bloom will be lost. I grow a few *Sauromatum guttatum*, not for the large, spotted, carribean-scented flowers which are commonly produced before the tuber is planted, but for the striking foliage with its serpent-spotted stalks. The tubers grow to the size of a cocoanut. The large ones are somewhat tender, but the offsets, of the size of a walnut, are perfectly hardy, such as are left over in the ground, coming up in the spring. I do not remember to have seen any complaint of the ravages of the black blister-beetles, the kind we see on the Golden-rod, among any garden plants, except the Asters. They have been quite troublesome here for a few years past, devouring Gladioli and Dahlias. These they destroyed to such an extent that, in 1894, at the end of August, I found it almost impossible to find a perfect flower of the latter or spike of the former, except, very curiously, a Lemoinei variety called Centurion, which was untouched, though the insects fairly swarmed on all sides of it. I know no way of fighting this pest except to pick them off. They have a way of dropping to the ground when alarmed, when a prompt foot can easily destroy them, since they generally lie still for a moment.

Canton, Mass.

W. E. Endicott.

Notes on Begonias.

BEGONIA IMPERIALIS is a species that is always admired when well grown; its flowers are not showy, and the plant is valued chiefly for its handsome foliage. It is grown here in shallow pans filled with loose light soil and in a house where the temperature ranges from fifty-five to sixty degrees. A partially shaded position and a rather moist atmosphere suit it. It has short, thick, creeping stems, and its dark olive-green leaves have irregular bands of bright green along the nerves. The leaves are cordate and from four to six inches wide and are completely covered with long hairs. The hairy petioles raise the leaves from four to six inches above the soil in the pots or pans, and when the plants are healthy and happy the foliage completely hides the soil. The small white flowers are produced on erect peduncles. The flowers have two petals and the ovary is three-angled, with one long wing. There is a variety of this species grown here which is known as *B. imperialis Smaragdina*, which makes an excellent companion for the type plant, from which it differs in having leaves which are entirely green. *B. imperialis* was introduced from Mexico by Verschaffelt.

Begonia incarnata is one of the very best species for winter flowering. The plants grown here are raised annually from cuttings made from healthy shoots in March. With a slight bottom-heat the cuttings root in a short time, and are then put into four-inch pots. In June they are planted out in the garden in a shady position, where they are well looked after in the way of watering and stirring the soil occasionally between the plants. About the first week in September the plants are lifted, being large enough then for six-inch pots, and whenever there are signs of cold nights they are put into the greenhouse. This plant is well known in gardens, and was introduced from Mexico in 1822. It has a neat habit, with erect stems from two to three feet high. The stems are well covered with unequally cordate, lanceolate, toothed leaves, which are green above and reddish beneath. The rose-colored flowers are borne on arching peduncles, the larger staminate ones having two ovate and two narrow petals, while the pistillate ones have five equal petals. The ovary is three-angled, and the wings unequal.

Begonia acuminata makes a compact bushy plant from two to three feet high, and although its flowers are not very large, yet they are very pleasing. It does very well planted out in the garden during the summer months in a sheltered and shady position, and through the winter and spring it produces white flowers an inch across. This species is a native of Jamaica, and the plants that are grown here were collected in the mountains there by me four years ago.

Begonia Olbia was introduced about twelve years ago from Brazil. Although it is a handsome plant and is easy to grow, yet it is not very common in gardens. It blooms best when about two years old. Young plants raised in spring from cut-

tings, although they have handsome foliage, bear flowers which lack the size and substance of those produced on older plants. This *Begonia* has stout, fleshy, erect stems, with leaves which have an oblique outline. Their upper surface is of a very dark bronzy green, dotted over with neat white round spots and covered with small red hairs. The under side of the leaves is deep red. The white flowers are produced in large cymes from the axils of the leaves.

Begonia Froebeli is a tuberous-rooted species which makes an excellent winter-flowering plant. Young plants raised from seed sown last March have flowered well; but seedlings do not show their true characters the first year. Some of the oldest tuberous root-stocks that are here have been grown for nine or ten years at least, and I have known them personally for eight years. When the plants have finished flowering and the leaves begin to show signs that their work for the season is over, water should be given more sparingly and finally withheld altogether. When the plants are at rest the pots are put on a shelf in the greenhouse, where they are kept dry until they show signs of growth, which usually begins in September or October. The old soil is shaken from the tubers and the plants are put into four-inch pots, and when these are full of roots a final shift is made into eight-inch pots. The leaves are annual and are obliquely cordate; some of them now measure fourteen inches long by ten wide. They are gray-green and covered with purplish velvety hairs. The flowers, measuring two inches across and borne on tall drooping cymes, are a brilliant scarlet. [See page 504.—ED.]

Botanic Garden, Harvard University.

Robert Cameron.

Correspondence.

Schools of Horticulture.

To the Editor of GARDEN AND FOREST:

Sir,—Your editorial in a recent issue on the "Schools of Horticulture," which have been conducted at a few points in New York state, has suggested to me that your readers may not be aware of a somewhat similar work carried on in New Jersey. The Extension Department of Rutgers College was organized in 1891. There have been given here in New Brunswick two very successful courses in Botany, the audience consisting of both men and women, residents of the town, and numbering more than fifty. Of these about twenty-five pursued the collateral studies prescribed by the lecturer and passed successfully a fairly difficult examination. The work done has been so creditable that the lecturer, Dr. Halsted, suggests an advanced course to follow, on Vegetable Anatomy, with laboratory practice with the compound microscope.

But I have more particularly in mind the successful application of University Extension methods to instruction in practical horticulture and agriculture made by the Extension Department, in affiliation with the State and the College Experiment Stations.

The methods employed are those now familiar to all under the name of University Extension, and need no description beyond noting that the unit course consists of six lecture-studies, each exercise involving a lecture proper and a class-hour for conference and discussion, together with printed syllabus, collateral reading, experiments and examination. We have arranged a series of courses on agricultural subjects, such as Agricultural Botany, Economic Entomology, Plant Foods, etc., forming quite an extensive curriculum. At present the series consists of nine courses, which we encourage our centres to take in regular sequence. As soon as the farmers are ready for it it will be easy to extend the same plan so as to cover the ground more thoroughly, and to offer some freedom of choice in accordance with the particular needs of any community. Thus, while the general courses would remain the same the more specialized courses would be different in a fruit-growing community from those recommended to a community chiefly interested in the dairy business. One of our centres is now taking the regular sequence of courses that we have laid out, and others are planning to do so. If the farmers will, in general, be willing to persevere on so systematic a scale we shall have University Extension at its very best.

The results thus far attained deserve, I think, to be generally known. The work was begun tentatively in the winter of 1891 and 1892, with a course at Freehold. Since then we have given courses in eleven different farming communities, not counting the work of the present season, which is just now beginning with a course in Botany at Moorestown. The system has received a most cordial endorsement from the State Board of Agriculture (see twenty-first Annual Report, page 106),

and the courses given have been, in general, notably successful.

In the first place, we have reached the men we desired to reach. The audiences and classes have been made up almost wholly of farmers, the large majority being between twenty-five and thirty-five years of age. The attendance, too, has been good, running as high as 119, and averaging sixty for all the courses. This has involved drives over country roads of long distances, as much sometimes as twelve miles each way.

Again, a serious purpose has been unmistakable. Almost the entire number in attendance remains for the second hour, and the discussion of practical applications of the different subjects has proved the most interesting part of the exercises. The majority have made diligent use of the syllabus, and a large number of the younger men have taken up the collateral reading in earnest. We should not naturally expect mature men engaged in active business to be willing to submit to an examination, yet not less than thirty-two persons, nearly all men, have, at the end of the six weeks' course, taken an examination on the subject treated, and twenty-nine have been successful in passing and have received the regular Extension credits.

The purely educational results, though difficult to estimate, are the most important. The practical results are easier to specify and could be detailed at considerable length. I limit myself, however, to one or two. After a course, before a Fruit Growers' Association, on The Food of Plants, a committee of farmers was appointed to purchase fertilizing materials in accordance with formulas furnished by the lecturer, instead of the prepared fertilizers already mixed, and on one hundred tons purchased a saving of \$1,500 was made. In one case a permanent agricultural society which meets for the discussion of agricultural topics and has charge of the arrangement of Extension work from year to year, is the direct outgrowth of one of our courses. In general it may be said that the most important practical result is that many individuals throughout the state have been drawn into closer relations with the experiment stations.

All this is entirely distinct from the work of the Farmers' Institutes, where a very large number of single lectures are delivered each year, and it proves clearly that the methods of University Extension may be made useful in spreading the knowledge and practice of scientific agriculture.

Rutgers College, New Brunswick, N. J.

Louis Bevier.

Recent Publications.

The Soil: Its Nature, Relations and Fundamental Principles of Management. By F. H. King, professor of Agricultural Physics in the University of Wisconsin. New York : Macmillan & Co.

It was a happy thought to issue a series of handy monographs on agricultural subjects in which the problems of rural economy should be discussed in the light of the most recent discoveries in science. This first volume, relating to the soil, presents its history, showing how sun and air and water and various forms of life have been working through long cycles of geological time and are working still, not converting it into a mere inert assemblage of chemical particles, but developing it into a scene of life, a storehouse of energy, a laboratory where invisible organisms are constantly building up and tearing down and shaping it in a hundred ways for future use. The book aims constantly to lay down principles as the basis of practice rather than to offer a collection of rules to be learned by rote. A very considerable amount of science is set forth in a popular, but in a clear and logical, way, and this will not only furnish justifying reasons for most of the ordinary processes of horticulture and agriculture, but will, of course, suggest experiments looking toward the discovery and adoption of new and improved methods. Such subjects as the physical effects of tillage and cultivation, drainage, irrigation, soil-water and its conservation, the temperature of soils, the distribution of roots, etc., are all treated with fullness and clearness. The book is written in a pictorial, though sometimes in a rather inflated, style, but it cannot but fasten the attention of any intelligent reader who is not familiar with the facts presented, and the interest is sustained from end to end. If it could be read aloud to a circle of young students of rural affairs it would

certainly prove stimulating and helpful. The series is edited by Professor L. H. Bailey, and we shall look forward with much interest to the volumes which are to follow.

Maladies des Plantes Agricoles. Vol. I. By Professor Ed. Prillieux. 8vo, 420 pp., and 190 figures. Firmin-Didot, Paris, 1895.

This compact and handy volume forms one of the series entitled *Bibliothèque de l'Enseignement Agricole*, which includes a number of practical treatises on different subjects relating to agriculture. We have in recent years received from Germany a number of general works on plant diseases, and the present volume is a welcome addition to the American student of vegetable pathology, for it offers in a condensed and copiously illustrated form a presentation of the subject from the French standpoint. The author, Professor Ed. Prillieux, of the Institut National Agronomique, has the talent, characteristic of his nation, of writing in an interesting manner, and has given a simple statement of the subject, wisely avoiding lengthy discussions of disputed questions. The present volume includes the diseases of cultivated plants as well as those of fruit and forest trees which are caused by vegetable parasites, beginning with those caused by bacteria. A second volume, which we presume is to include diseases caused by non-vegetable parasites, is announced to appear soon.

Notes.

Varieties of the European Holly with yellow berries are not uncommon, but we never happen to have seen one of our native Hollies with clear yellow berries until we received some specimens from Professor Massey, of the North Carolina Agricultural Experiment Station. Professor Massey says the trees are not common there, but there are a considerable number of them. It is rather remarkable that so little has been heard of them and that they have not been propagated for commercial purposes.

The parts of Engler & Prantl's *Pflanzenfamilien* from 120 to 125, inclusive, have recently reached us, and are devoted to the Loganiaceæ, by Solsreder; the Gentianaceæ, by Gilg, and the Apocynaceæ and Asclepiadaceæ, by Schumann. Part 123 is accompanied by a most instructive and interesting illustration from a photograph made in the state of Hidalgo, Mexico, showing in the foreground masses of the tall stems of the Old Man Cactus, Cephalocereus senilis, and large specimens of the spherical Echinocactus ingens.

The leaves of the Japanese Grapevine, *Vitis coignetiae*, were killed in the Arnold Arboretum this year by the frost before they assumed their autumn colors. Generally they take on hues of great brilliancy, and they make a wonderful display in the forests of Japan where they climb into the upper branches of the loftiest trees. We have received recently from Mr. A. Blanc, of Philadelphia, some leaves of this vine which were intensely scarlet, and a large plant covered with them would certainly make a striking display. *V. coignetiae* ought not to be overlooked by any one who is planting with a view to autumn effect.

Not long ago Professor Bailey told one of his classes that he was impressed more and more with the fact that persons who know nothing about horticulture to begin with often become most successful when they once enter the business. This simply means that these men start without any prejudice and with everything to learn, full of enthusiasm, and with minds open to accept any new teaching which commends itself to them. Not long ago he visited one of the largest and most successful establishments for growing mushrooms and forcing vegetables in the country, where the manager but a few years ago knew nothing whatever of the business. Perhaps many of the best farmers of the future may be those who have not been brought up on farms of the present time.

Among the nuts exposed for sale we have lately observed for the first time in our fruit shops the Souari, or what are known as butternuts in the English market. They are called here cream-nuts, which name is really descriptive of their rich meat, and African nuts, although really they come from South America, where they are borne on a tree known to botanists as *Caryocar nuciferum*. They are somewhat kidney-

shaped, with a rich red-brown, warty and very hard shell. It requires a smart blow from a heavy hammer to burst this shell, since it is nearly half an inch thick in places. The nut is, perhaps, three inches in length at its longest diameter, and the chamber has a smooth satiny lining and incloses a soft, pure white kernel of a rich nutty flavor and covered with a brown skin. There are four of these seeds, or nuts, in the spherical fruit of the Caryocar, which is as large as a child's head. The tree itself often reaches a hundred feet in height, and its hard wood is very much prized for durability.

At this time of holiday display few places are more attractive than the shops where the finest fruits are sold. Even our commonest fruits, like apples and pears, when at their very best, all even and perfect in form and color, make a feast for the eye, while their fragrance, with its suggestion of their delightful taste, makes a combination most grateful to the senses. By the help of cold storage many of the late autumn pears are still offered, but none of them are more beautiful than the attractive yellow Beurre Boscs from Boston with one flushed cheek and dots and streaks of cinnamon. Not quite so handsome, but larger, is the Duchess; but there is no need to go through the list, for nothing can be more beautiful and few perfumes are more delicate than their musky or aromatic odor. Perhaps the most ornamental among the apples is the glossy little Lady Apple with a red cheek on a lemon-yellow ground. Very attractive, too, is the crimson-shaded, light green York Imperial, the dark red Winesap, from Virginia, and the perfectly shaped King. Neat-looking strawberries can be had for seventy-five cents a basket, and Black Hamburg grapes, with berries almost as large as a plum, cost \$2.00 a pound. Nectarines, from Rhode Island hot-houses, of fair size and good color, are worth a dollar a dozen, while the occasional grape-fruit, borne on the few remaining trees in Florida which escaped the freezing weather last winter, commands \$2.50 a dozen. Pomegranates of unusual beauty, their leathery rinds just tinged with an orange-red, bring \$2.00 a dozen, while prickly pears of a delicate flesh-color and tufts of small pink spines are quite as handsome as any other fruit and may be had for fifty cents a dozen. The Japanese persimmons are larger, more beautiful and better-flavored than any ever seen in this city before. It may be that the best varieties are just becoming sufficiently plentiful to be marketed in quantity. At all events, there are three or four kinds on sale quite distinct in shape, some of them being round or flattened, others egg-shaped or conical, some a rich yellow and others a deep red, and there are dozens of them together which average at least three inches in diameter, with a luscious pulp and a marked flavor which makes them quite superior to the commoner kinds which are somewhat undecided and characterless in taste.

The staple variety of Blackcaps for evaporating is the Ohio, although the Gregg is properly crowding it out in many of the bestberry sections. This latter variety is valuable because it demands better land and better cultivation than that under which the Ohio will thrive. It, therefore, has a salutary and stimulating effect upon the grower, and when it has this good care it is an abundant and sure cropper. The red varieties are seldom evaporated, because there is little demand for them; they require too much time on the tray, and too many of them are needed to make a pound. The Cuthbert is the only red berry which is evaporated. The Shaffer is the only purple berry that is dried in any commercial quantity, but it is hardly profitable to handle since it loses too much in the process. The new Columbian Raspberry is rather more vigorous in growth than the Shaffer, has a longer season, is firmer, with more uniform drupelets, and will probably be better than the Shaffer for drying. The amount of fresh berries required for a pound of the cured product is variable. On an average a little more than three quarts, say four pounds, of Blackcaps, are needed to make a pound of evaporated fruit, and in moist seasons four quarts are usually required. At the end of the season, when the berries are small and dry, two quarts may make a pound, while from four to five quarts of red berries are needed. When evaporated raspberries were first put upon the market thirty to forty cents a pound were common prices, but as these were clearly excessive they fell as production increased. From sixteen to seventeen cents a pound has been the average price for the past three or four years, and there is profit in these prices when there is a good crop, but there are many fields in which twice this price would not leave any margin over expenses. All these details are found in the interesting Bulletin No. 100 of the Cornell Experiment Station, to which allusion was made in a recent editorial article. According to Professor Bailey, some growers hold that the berries should

go into the evaporator when the price falls below eight cents a quart, while others sell them until they fail to net seven cents. An efficient evaporator has a good effect both upon the market and the grower. It keeps the surplus green fruit out of commerce and informs the buyer that he must keep prices up to the paying level or he cannot get the fruit. It makes the grower, in a measure, independent of the market, and more than that it leads him to save windfall apples and surplus berries and other material which would go to waste.

Mr. M. S. Bebb, the accomplished salicologist, and, since the death of the Swedish botanist, Andersson, in 1880, the best authority on the difficult genus *Salix*, died on the 5th instant at San Bernardino, California, where he had gone from his home in Illinois a few weeks ago, in the hope of obtaining relief from the pulmonary troubles from which he has been a sufferer for several years.

Michael S. Bebb was born on December 23d, 1833, in Butler County, in south-western Ohio, then nearly a wilderness, where his grandfather, Edward Bebb, a Welshman, had been one of the first settlers in the fertile valley of the Miami River. His father was a teacher and then a successful lawyer in Hamilton, the county town to which the family removed in 1835, and in 1846 was elected Governor of Ohio. A garden well-stocked with flowering plants and fruit-trees surrounded the Bebb mansion in Hamilton, and here the future botanist, while still a boy, acquired his first knowledge of plants, learning laboriously, without the aid of a text-book, the rudiments of the science from a copy of Torrey's *Report upon the Flora of New York*, which had accidentally come into his hands. In 1850 Governor Bebb retired from politics and moved to a large tract of land which he had purchased in the Rocky River valley in northern Illinois, near the present town of Fountaintdale. Here the lad's love of botany was confirmed by the acquisition of other botanical books and by the acquaintance which he made five or six years later with Dr. George Vasey, then of Illinois, and for many years before his death the botanist of the Department of Agriculture of the United States. This acquaintance led to an interchange of specimens; and about this time, too, he visited New England, where he met several men of science who confirmed him in his intention to devote himself seriously to the study of botany. During the War of Secession Mr. Bebb accepted a position in the Pension Bureau in Washington, which he held for several years, and then, returning to Illinois, he purchased the paternal homestead at Fountaintdale and settled down to botany, and especially to the study of Willows. The largest and most complete collection of these native and exotic plants which has been made in the United States was planted by Mr. Bebb at this time on land near his house, but, unfortunately, was destroyed a few years ago when he had taken up his residence in Rockford, Illinois. Since 1874, when he described his first Willow in *The American Naturalist*, all the collections of these plants made in North America have been studied by him. He described the California species in Brewer & Watson's *Botany of California*, the south-western species collected by Rothrock in the sixth volume of *Wheeler's Reports*, the Colorado species in Coulter's *Manual of Botany of the Rocky Mountain Region*, and the species of the eastern states in the last edition of Gray's *Manual*. He has determined the Willows collected by the officers of the Geological Survey of Canada in all parts of British America, and has contributed to botanical journals many papers upon the American species of the genus, including an important one published in *The Bulletin of the Torrey Botanical Club*, upon the Willows of the White Mountain region of New Hampshire. His latest publication appeared only two weeks ago, when he described a new species of Willow from Washington in the columns of this journal, which he has enriched during the last months of his life with a series of papers devoted to a discussion of the specific rank, distribution, etc., of several of the least-known and most interesting tree Willows of the continent. It was Mr. Bebb's intention to have elaborated in the form of a monograph the results of his long and careful researches upon American Willows; and during the last year he has devoted as much time as his failing strength would permit to reexamining for this purpose the mass of material which he has gathered in his herbarium.

Mr. Bebb will be known to science as an acute and enthusiastic botanist, but those who have met him remember him first of all as a delightful companion. He was a generous, high-minded man, with great dignity and ~~and~~ ^{and} of manner, and one who always inspired respect as well as affection. To a very wide circle of naturalists with whom he has been a helpful and unselfish co-worker his death will be felt as a personal loss.

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TABLE OF CONTENTS.

	PAGE.
EDITORIAL ARTICLES: —The Study of Principles as a Help to Horticultural Practice.....	511
Quarantine against Injurious Insects.....	511
Thomas Andrew Knight	512
California Fruits	<i>D. M. Rowley.</i>
Scale Insects Liable to be Introduced into the United States, <i>Professor T. D. A. Cockerell.</i>	512
NEW OR LITTLE-KNOWN PLANTS: — <i>Stapelia gigantea.</i> (With figure).	<i>W. W. Smith.</i>
PLANT NOTES:	513
CULTURAL DEPARTMENT: —Pruning of Street-trees	<i>G. W. O.</i>
Notes from the Harvard Botanic Garden...	<i>R. Cameron.</i>
The Eranthemums.....	<i>N. J. Rose.</i>
Hybrid Perpetual Roses	<i>E. O. Orpet.</i>
Propagating Chrysanthemums.....	<i>T. D. H.</i>
<i>Solanum capsicarium.</i> <i>Lælia anceps</i>	<i>N. J. R.</i>
CORRESPONDENCE: —Chrysanthemums.....	<i>T. D. Hatfield.</i>
Viburnum Lantana.....	<i>Joseph Meehan.</i>
Irrigation in New Jersey	<i>Professor Byron D. Halsted.</i>
MEETINGS OF SOCIETIES: —Irrigation for Kansas Farms and Orchards.....	518
RECENT PUBLICATIONS:	519
NOTES:	520
ILLUSTRATION: — <i>Stapelia gigantea, Fig. 71.</i>	515

The Study of Principles as a Help to Horticultural Practice.

Two bulletins on the care of fruit-trees, just issued by the Cornell Experiment Station, are not only directly instructive upon the subject of which they treat, but they furnish good examples of two methods of investigation. One of these, Bulletin No. 103, has been prepared by Professor Roberts, and it is a record of some very careful experiments undertaken to answer the question whether the comparative failure of the orchards in western New York is not largely due to the exhaustion of the soil. By careful weighing and analyzing of wood, fruit and leaves it was determined with some accuracy that the value of the principal plant-foods—that is, the value of the nitrogen, phosphoric acid and potash—which would be taken from an acre of productive orchard in twenty years would amount to some \$400, while the total value of the same plant-foods that would be taken up by the grain and straw of crops of wheat grown on an acre of land for twenty years in succession would not amount to one-third as much. No one would think of raising wheat for twenty years consecutively on the same land, and the wonder is not so much that old orchards fail, but rather that they did not cease to produce merchantable fruit years ago. This experiment, therefore, establishes the fact that there is sufficient robbery of the soil to account for the lessening yields of fruit, but, of course, it does not follow that the simple return of this amount of plant-food to the soil would necessarily give full crops. No doubt, there are other disturbing causes, and we must know, at least, where and in what manner the food must be given and what trees to select and how to treat them so that they may use this food to the best advantage.

Bulletin No. 102, by Professor Bailey, on the contrary, does not contain a single experimental fact. A mass of data has been gathered from wide and long observations of orchards under many conditions, and then it has been attempted to deduce certain principles from them. This is not the usual method of the stations, but, certainly, when such inquiries are conducted in a judicial spirit, they admirably supplement special investigations. The investigation of the behavior of a single tree very

properly accompanies the generalization from many hundred orchards, and it is important to observe that the two inquirers arrive independently at the same essential conclusion, which is, that orchards need more thorough tilling and fertilizing than they receive.

What we should like to emphasize here is that the primary need of cultivators of the soil is principles rather than information. Broadly, it is education that is needed rather than specific knowledge. People who demand what they call practical instruction really want information for a particular case; that is, they want rules for some local and inflexible conditions, but really this is what no one can give. The experiment station cannot tell the farmer exactly what must be done with his particular farm. The best that can be done is to furnish him with principles which he must apply for himself. He knows his own soil as no one else does, he knows his own resources and limitations, and he ought to be able to make use of general principles as they apply to his own particular case better than any one else. Professor Bailey's bulletin shows him that there may be many causes why his apple crops fail, but he must ultimately decide for himself what is the fundamental trouble. He may not do this to-morrow, or even next year, but if he familiarizes himself with general laws and studies his land and his crops he will in the end master the problem. If the experiment station were to take charge of his farm and conduct it for him he would in the end be the loser, because he would learn nothing except to rely upon others rather than upon himself, which is a lesson above all others to avoid.

It is not our purpose to speak of the contents of these bulletins only so far as to explain the different methods upon which they have been prepared, but it may be well to state that one of the reasons assigned by Professor Bailey for the probable failure of many trees to bear paying crops is that they have been propagated from unproductive individuals. This is something which is rarely taken into account, and yet we all know that no gardener would take a cutting from a Rose-bush which bears no flowers. Why, then, should we take a cion from a tree which is unproductive as individuals often are, or from one which is not desirable in habit, or which lacks vigor. It is hazardous to enunciate general laws, but it would certainly seem worth while to select grafts from trees of individual merit, which have been known as productive for a period of years. Time would show whether anything is to be gained by this practice, but unless all analogies fail it ought to prove a profitable experiment.

An article in another column of this issue, on the danger which threatens the agriculture and horticulture of the country from certain foreign insects, invites attention once more to a subject we have often discussed. The constitutional difficulties in the way of preventing the contagious diseases of animals and plants, as well as destructive insects from spreading from state to state, are serious ones, but the subject here touched upon is not connected with interstate commerce, but with importations from foreign countries. It is, no doubt, as much within the power of the Federal Government to make quarantine laws against scale insects as it is to protect men and domestic animals from the germs of disease. The losses which this country suffers through insects are estimated by hundreds of millions of dollars every year, and it is well known that many of the most dangerous of these pests of our orchards and gardens have come from foreign countries. California has a quarantine officer who is apparently rendering the state a genuine service, and if the abounding scale insects of the tropics are to be prevented from invading our southern coasts some similar action must be taken on our Atlantic seaboard. We need to know more of these insects and of their habits, so that we can detect them before they gain a foot-hold here. We know that a dangerous scale insect from California has been found in abundance on the fruit-stands of our eastern states.

Equally destructive pests may effect a landing in some of our seaports on the fruits and vegetables which we receive from the West Indies and from South America, as well as upon the decorative or other plants imported. We have an association of economic entomologists, and this body ought to be able to frame a bill to establish a quarantine, not only against injurious insects, but against the contagious diseases of plants. There is also an organization made up of the officers of the experiment stations and the professors of the agricultural colleges, whose natural duty would seem to be a general oversight of the interest of agriculture and horticulture. The subject in question ought to be worth careful study by a body which represents the entire nation, and we see no good reason why a national quarantine bill should not be framed and introduced before the close of the present session of Congress.

Thomas Andrew Knight.

WE have already published one or two of the five-minute talks with which Professor Bailey, of Cornell University, prefaces his lectures on Evolution. One of his students again sends the following from her notes as worthy of permanent record :

Thomas Andrew Knight, one of the first and greatest of our botanical philosophers, was the forerunner of Darwin, who may be considered the second of our great horticultural philosophers. Knight was born in 1759 and died in 1838. He was educated at Oxford, and he lived at Elton and Downton Castle, England. He devoted his whole life to agriculture, but he also conducted experiments upon the crossing of plants, made various studies on the physiology of plants and the like. Nearly all of his writings have been productive of great good in after years. The first essay which he ever prepared is one upon the decay of fruit-trees and the causes therefor. This was written in 1795. As a means of averting the decay of the trees, he advised raising new varieties by crossing. He was the first man, so far as I know, who advised the use of cross-fertilization for the purpose of producing new varieties, and for the purpose of improving existing ones. A similar work was taken up by Darwin and made him famous. The teachings of Lord Bacon were leading sources of information when Knight began to write. Bacon was convinced that crossing in animals and plants is capable of yielding great results, but he was ignorant of the exact process. His opinions, which were current when Knight began his work, were as follows : "The compounding and mixture of plants is not found out, which, nevertheless, if it be possible, is more at command than that of living creatures ; wherefore it were one of the most noble experiments touching plants to find this art ; for so you may have a great variety of new plants and flowers yet unknown. Grafting doth it not : that mendeth the fruit, or doubleth the flower, but it hath not the power to make a new kind—for the scion ever overruleth the stock."

Knight was first brought to notice by Sir Joseph Banks, who was interested in agriculture, and whose name has come down to us as one of the leading scientists and naturalists of his time. Sir Joseph was interested in the Royal Agricultural Society, the members of which had drawn up a set of queries to which they desired answers from various districts, and Banks hit upon Knight as being the person to whom these queries should be addressed. Banks soon found that Knight "was not only eminently qualified to effect the immediate object in view, but that he had made observations, and deduced theories from them, calculated to throw much light on the more abstruse subject of vegetable physiology."

Knight was the first to make experiments to determine why roots go down and stems go up. In 1803 he made the acquaintance of Sir Humphrey Davy, who afterward became a very warm friend, and with whom a correspondence began which was of great benefit to both persons and continued until the death of the latter in 1829. The Horticultural Society of London was established in 1804. The first active president was Thomas Andrew Knight, who was elected in 1811 and served until the time of his death in 1838. The golden age of the society was covered by the period of his administration.

Knight was the first man to propose the theory that the variation of plants is due to excess of food-supply. He also produced a great number of new varieties of plants by cross-fertilization, and among Cherries we have the Elton at the present time, the Downton and others.

Payne Knight was an older brother of Thomas Andrew and became a famous Greek scholar and poet.

California Fruits.

A PAPER read by D. M. Rowley, editor of *The California Fruit Grower*, before the State Fruit Growers' Convention at Sacramento, gave some statistical compilations which are not quite as dry as figures usually are. In reviewing the trade in fresh deciduous fruits he noted that the earliest shipment eastward in the season of 1895 was two car-loads of cherries, sent on the 8th of May, although shipments of the same fruit had been made by express as early as the 17th of April, and auction sales of California cherries began in Chicago on the 13th of May. From the 8th of May to the end of October 4,435 car-loads were shipped altogether. Of these, 1,473 car-loads went to Chicago, 928 to New York, 279 to Boston, 176 to Omaha, 148 to Denver, 124 to Minneapolis, 109 to St. Paul and 42 to London, England. Twenty other cities are named as receiving less than a hundred car-loads during the year, but since there are about one hundred cities in this country which contain more than 40,000 inhabitants, and more than two hundred cities with a population of 30,000, it is not surprising that nearly 700 car-loads were sold in cities and towns not designated—that is, at points unknown to any one but the shipper.

The freight rate of a car carrying 24,000 pounds to Chicago from California is \$300, and this is regarded by railroad men as reasonable when the distance and character of the service is considered. Refrigeration charges are extra, \$90, for example, from Sacramento to Chicago, making a total of \$390 a car to that city. From this it appears that the freight and refrigeration on the 1,400 cars sent to Chicago would amount to more than half a million dollars. The freight rate to New York is \$360 and the refrigerating charges \$130, a total of \$490 a car, so that transportation charges on California fruit to New York amounted to more than \$450,000 during the year. Taking the average charges paid for freight and refrigeration for shipments to Chicago and New York it appears that the vast sum of \$1,931,480 was paid for the transportation of fresh fruits from terminals in California to eastern cities, and this does not account for the local freights paid by shippers before they reach the main line of the Southern Pacific Railroad Company. Of course, the commissions, cartage and other expenses connected with the shipping business at the eastern end of the line would greatly swell this amount. It ought to be added that shipments from California last year were smaller than they have been since the year 1891. In 1894 the grand total was 179,576,500 pounds.

Among varieties of fruits, peaches took the lead in quantity, amounting to 1,288 car-loads for the year; of pears there have been 1,167 car-loads, of grapes 910 car-loads, of plums 390 car-loads, of cherries 177 car-loads, of apricots 167 car-loads, of apples, so far, but 95 car-loads, of prunes 75 car-loads, of quinces 13 car-loads, and of nectarines 4 car-loads. The climate of California not only enables one to work out-of-doors all the year round and makes long seasons for fruit-growing, but it is also a good place for curing fruit, as the enormous increase in the amount of cured fruit bears witness. Exclusive of raisins and dried grapes, California has averaged during the last five years an annual production of more than eighty million pounds of dried fruit—that is, nearly 1 1/4 pounds of this product to every man, woman and child in the United States. Altogether, in the five years from 1890 to 1894 inclusive, counting the fresh deciduous fruits, citrus fruits, dried fruits, canned fruits and raisins, the enormous total of 2,308,298,400 pounds has been produced. The unestimated quantities of fresh and dried fruits produced east of the Rocky Mountains are, of course, additional to the California output, as also the hundreds of cargoes of bananas, oranges, lemons, pineapples, raisins, prunes, currants, figs, etc., received from foreign countries, and the enormous amount of fruit consumed in the United States can hardly be realized.

Scale Insects Liable to be Introduced into the United States.

ABOUT 140 species of scale insects are now known from the United States, of which, however, at least thirty-five have certainly been introduced through human agency. The following are noticeably injurious :

(1) Probably or certainly introduced. *Icerya purchasi*, *Gossyparia ulmi*, *Dactylopius adonidum*, *D. citri*, *Orthezia insignis*, *Asterolecanium quercicola*, *Pollinia pollini*, *Lecanium persicæ*, *L. juglandis*, *L. hemisphaericum*, *L. oleæ*, *Aspidiotus nerii*, *A. ficus*, *A. aurantii*, *Mytilaspis citricola*, *M. gloverii*, *M. pomorum*, *Aspidiotus perniciosus*, *Chionaspis citri*, *C. biclavata*, *Aulacaspis rosæ*, *Diaspis amygdali*, *Phenacoccus aceris*, *Lecanium hesperidum*, *Parlatoria pergandii*.

(2) Probably or certainly native. *Pulvinaria innumerabilis*, *Lecanium pruinosa*, *L. ribis*, *L. tulipiferæ*, *L. fitchii*, *Aspidiotus uvæ*, *A. aencylus*, *A. juglans-regiae*, *Chionaspis furfuris*, *C. ortholobis*, *Aspidiotus rapax*. The second and the last have, perhaps, been introduced.

Thus it is seen that most of the injurious species have been introduced into the country; in fact, all of those which are of first importance, if we, perhaps, except *Chionaspis furfuris* and *Pulvinaria innumerabilis*. It is just possible that *Aspidiotus perniciosus* is native. Just lately, *Asterolecanium pustulans* has turned up in Florida, and *Dactylopius virgatus* in Texas. These species are not yet complained of in the United States, but both are very injurious in certain tropical localities, such as Jamaica.

In the great majority of cases it is not known exactly how or when the introduced species reached this country, but it may be broadly stated that they all came on plants. Positive evidence is, however, afforded by Mr. Alexander Craw, the energetic horticultural quarantine officer of California. He boards the steamers that arrive at San Francisco, and inspects all plants and trees about to be landed. Quite frequently he finds them infested with scale insects, and in all such cases has them destroyed, being empowered by the law of the state to do so. The labors of Mr. Craw have probably not been appreciated at their true value; in fact, it is impossible that they should have been, because the most remarkable results he has achieved have not yet been published. Unfortunately, we possess no detailed or accurate information regarding his earlier finds, but recently he has been sending me the species detected, and without naming them here I may say there were seven on plants from Japan, three from Honolulu, two each on plants from Mexico and Central America, and one each on plants from Tahiti, the Marquesas Islands and Australia.

Not a single one of these scale insects is native to this country, and only one, *Aspidiotus aurantii*, is established in California. Some of them, *Diaspis amygdali*, for example, are known to be very injurious. Yet these results have all been obtained quite recently; in fact, every month seems to make remarkable additions to the list. Let the California people consider what it would have been worth to them to have kept *Icerya* and the San José scale out of the country; let them now consider, in view of recent experiences in the east, what it would be worth to keep *Diaspis amygdali* (*lanatus*) out. The damage done by either of these species in a few years would exceed the salary of a dozen quarantine officers.

It is hardly sufficient to say that California is pursuing a wise policy in this matter; to do otherwise, with the interests she has at stake, would be sheer imbecility. In view of all this, it seems amazing that nothing in the same way is being done in the east or south. I do not propose at the present time to discuss the question of quarantine along the Atlantic seaboard, but rather to call attention to the condition of affairs in the south. From California to Florida there is no serious attempt made of any kind to prevent the introduction of pernicious insects.

From the regions south of the United States (Central and South America and the West Indies) are known at present

about 130 species—that is, not quite so many as from the United States. But there can be no doubt that the tropics of America are very rich in scale insects, and the reason why no more are recorded there is simply that, except in the West Indies, very little collecting has been done.

To illustrate the abundance of scale insects in the tropics I may say that I found in the small garden attached to Dr. Strachan's house, in Kingston, Jamaica, July 27th, 1892, sixteen species and varieties, seven of which have never been found in the United States. It is true that one of them, the species *Parlatoria pergandei*, occurs in our country, but the variety *Crotonis*, which I found, has an entirely different food-plant, and from an economic point of view is quite a different thing. Perhaps the most pernicious species among the sixteen not found in the United States is *Aspidiotus articulatus*, which attacks Citrus-trees as the red scale does in California.

To give anything like a list of the scale insects in the West Indies which are liable to be imported into this country would occupy too much space. But there are specially dangerous ones infesting Citrus-trees, Sugar Cane, Sweet Potato, Yam, Cotton, Palm, Hibiscus, Acalypha and other plants which are articles of common transportation.

As regards Mexico and Central America our knowledge is singularly deficient, and would be fragmentary, indeed, had not Professor C. H. T. Townsend lately been collecting in Mexico for the Department of Agriculture. The results of his mission will be set forth in a bulletin shortly to be published; but it may be permissible to state now that he found, in particular, several injurious scale insects upon the Citrus-trees. One of these, *Aspidiotus scutiformis*, has never yet been detected in the United States. Thus we are threatened all along our southern border, and the process of introducing injurious species, which has gone on so far almost unheeded, is likely to lead to consequences more serious than are often contemplated. It is true that the climatic differences, from south to north, afford a certain amount of protection, but the way in which the *Diaspis amygdali* (*lanatus*), of the West Indies, has established itself in the city of Washington should convince any one that immunity from differences in climate cannot be relied upon. Nobody supposes that many West Indian species could establish themselves far north in the United States, but many are already common to the tropics and the southern states, while trouble may even be caused in the north in hot-houses, as with the mealy bugs and *Orthezia insignis*. It is not necessary to postulate that the Coccids should destroy whole crops, in order to make out a case for preventive measures. The profit usually represents but a small part of the value of the crop, and the insect has but to eat that up to ruin the business. Thus any loss will be felt, unless, perhaps, in times of so-called overproduction.

It is useless to cry out after the harm is done; now is the time; in a few years it will be too late, as indeed it is already too late to stop many species. The indications from the facts at hand are plain. In the first place, strenuous efforts should be made to ascertain more accurately the Coccid fauna of the whole neotropical region, and especially of those parts near our own borders. In the second, quarantine should be set up, as in California, at those places through which plants are brought into the United States. These are not numerous, and probably it could be made unprofitable for importers to bring their plants through ports not quarantined; that is to say, if the trade would recognize that no plants could be safely received unless certified as clean by the appointed quarantine officer, non-inspected plants would lose some of their value, even if salable.

Las Cruces, N. M.

T. D. A. Cockerell.

The element of interest which, beyond question, should be placed first, if possible, in the park of any great city is that of an antithesis to its bustling, paved, rectangular, walled-in streets—a requirement best met by a large meadowy ground of an open, free, tranquil character.—*Olmsted & Vaux*.

New or Little-known Plants.

Stapelia gigantea.

THE illustration on p. 515 is reproduced from a photograph of the plant of *Stapelia gigantea*, which was briefly referred to recently in GARDEN AND FOREST (p. 454), which flowered a few weeks ago in the Royal Gardens, Kew. The flowers are a foot in diameter, leather-like in texture, the surface wrinkled and the color pale yellow, with red-brown transverse lines and covered with very fine silky purplish hairs. Each flower lasts two or three days, and on first opening emits a disagreeable odor. It is more than thirty years since this species was introduced into English gardens from Zululand, but it did not flower till 1888, when a plant in the collection of Sir George Macleay, Pendell Court, Surrey, produced flowers in November, and from these the colored plate in *The Botanical Magazine* was prepared. Sir Joseph Hooker there speaks of it as follows: "This, some *Rafflesias* and certain species of *Aristolochia* are the largest-flowered members of the vegetable kingdom, and, what is curious, all are most fetid and have lurid colors. They agree in no other characters; they differ altogether in botanical affinity; and they inhabit widely distant parts of the world, namely, south Africa, Malaya and Brazil." To this category may be added the great *Amorphophallus Titanum*, which has the largest of all floral structures, with lurid colors and a penetrating disagreeable odor.

The claims of *Stapelias* generally to the notice of horticulturists were urged in an article published in GARDEN AND FOREST in 1890, page 179, where also will be found directions for their cultivation, based upon experience at Kew and in a few other gardens where these plants find favor. The requirements of *S. gigantea* are somewhat exceptional. It thrives only when grown in a hot moist stove from April till September, when the growth matures and the flower-buds show. It should then be hung up or placed upon a shelf near the roof-glass in a sunny dry position in the stove. It grows very freely under this treatment, the plant represented in the picture being only eighteen months old from a cutting. The prostrate stems branch freely and produce roots from every node.

Many of the species of *Stapelia* are small in flower and altogether wanting in characters that would recommend them for the garden; there are, however, some which have large and attractive flowers, and are to be obtained from a few nurserymen. They are *S. Bufonis*, of which *picta* and *variegata* are forms; *S. deflexa*, *S. grandiflora*, *S. Desmetiana*, *S. hirsuta*, *S. Plantii*, *S. sororia* and, of course, *S. gigantea*. The first-named is the best known of all, and is the common Carrion-flower. It can be grown in a cold greenhouse or even in a room window where direct sunlight can reach it. *S. grandiflora* has flowers five inches in diameter and is covered with long purple hairs; *S. Plantii* is another large-flowered species remarkable for its stout, erect, dark green stems and zebra-marked purple and yellow hairy flowers. These are all easy to manage and flower every year. I may as well mention here that *Stapelias* are not Cacti, but Asclepiads, although it is usual for nurserymen to class them with Cacti, and I have even seen them thus classed in books. They are all African.

London.

W. W.

Plant Notes.

PHYLLOTÉNIUM LINDENI.—This is one of the most beautiful foliage-plants of the Calla family. The leaves sometimes grow to a height of four or five feet, with a blade two feet in length. The plant forms immense masses of foliage if it is not divided too often, and while a rather moist and warm atmospheric condition is best for its development, it can stand drought and a certain degree of cold for a considerable time with immunity. As a plant for the house it is unequalled, and requires comparatively little attention. The leaves are hastate in outline, borne on erect, rather

fleshy, leaf-stalks; the blade is green, marked along the middle and principal veins with broad bands of white. The effect is rich and luxurious. Rich loamy soil, with good drainage, and a temperature of about sixty-five degrees are the best conditions for success, and if it is kept moderately warm, moderately moist and absolutely clean this handsome Aroid cannot fail to give satisfaction.

APHELANDRA ORIENTALIS PUNCTATA.—This is a handsome stove shrub with lanceolate opposite leaves of a bright green color, variegated and spotted along the midrib with a broad irregular band of silvery white and more or less sprinkled over with silvery dots. The habit is rather slender, but by means of pinching the young shoots quite nice and bushy plants may be had. Like most tropical plants of its family (Acanthaceæ), it is an exceedingly fine subject for table decoration if properly treated. Cuttings root in about two weeks, but require a brisk bottom heat. A rich vegetable soil composed of one part loam, one leaf-mold, one well decayed horse-manure and one part sand is the best soil that can be obtained for this and similar plants. Any one interested in fine foliage-plants for a stove or warm greenhouse will find this a very rare and pleasing subject.

DICHORISANDRA UNDATA.—Among the smaller foliage-plants suitable for small conservatories and greenhouses, this beautiful species takes a prominent place. It is nearly related to *Tradescantia*, and is not unlike some of the large-leaved forms of that genus. The leaves are subcordate, or nearly orbicular, with a peculiar wavy or ruffled surface; deep olive-green, with several longitudinal grayish bands, of which the middle one is broadest, about half an inch wide. The stem is thick and fleshy, and the leaves are produced close together at the top. The usual size of the plant in greenhouses is about eight inches, although it probably grows larger in its native home. To be satisfactory, the plants should be grown into broad bushy specimens, when they are very ornamental. Propagation, by means of cuttings in bottom heat. The soil should be rich and fibrous. Plenty of water is needed in summer, as well as a shady position and about seventy degrees of heat.

Cultural Department.

Pruning of Street-trees.

THE Parking Commission of Washington has been in existence for more than twenty years, and the same men who were appointed at the beginning, W. R. Smith, William Saunders and John Saul, are serving on it still. As might be expected from the work of an intelligent body, much valuable information has been accumulated, especially as regards the system of pruning adopted. It has been the custom of the Parking Commission, when planting three or four year old trees on the streets, to head them back to a height of about nine feet from the ground and shorten in all lateral branches. This has worked satisfactorily, as it tends to make the tree push out fresh growths, and at the end of the first year the trees look as if they had not felt the change.

It is in the treatment of the trees after they have attained the age of a dozen years or more that the results of the different methods of pruning are so very noticeable. For example, the Occidental Plane, if left to itself, will grow very irregularly, become sickly, and then invite attacks by scale insects, which soon threaten to kill them altogether. On several of the streets a few years ago this was exactly the condition of these trees. Heroic measures were decided upon in the way of cutting back the branches to within a short distance of the stem. This was carried out on several miles of streets, much to the horror and dismay of the property-owners, who declared that the members of the commission had suddenly turned insane. The commissioners said nothing, probably they had some doubts as to the results of the experiment. The treatment proved to be the proper one, however, and within two years from the date of pruning, the streets where the pruning was done had the most beautiful trees in the city. The Oriental Plane grows into a more symmetrical shape and does not need the knife so often to keep it in shape or to give it new vigor as does *Platanus occidentalis*.

North Carolina Poplars, which have been pruned severely

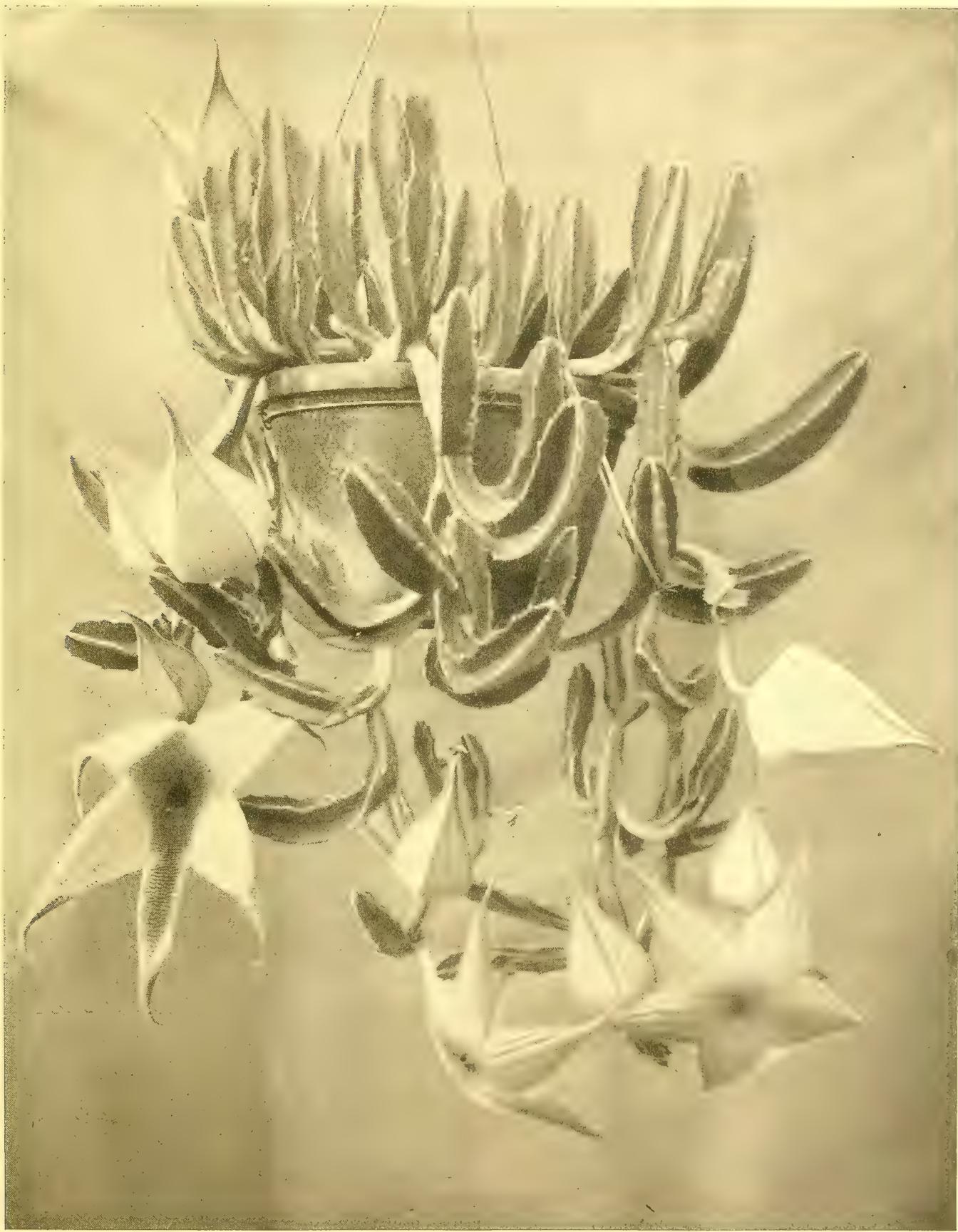


Fig. 71.—*Stapelia gigantea* at Kew Gardens—one-fourth natural size.—See page 514.

because their branches have become straggling, are refurnished very quickly after pruning with strong growths. These growths appear well for the first part of the season, but after a period of dry weather they are the first to lose their leaves, while those Poplars which have only been moderately pruned retain their foliage much longer.

The Maiden-hair-tree, *Ginkgo biloba*, has one marked peculiarity. Some specimens after planting stand still and absolutely refuse to grow. Most of the trees make an open growth, as may be seen on the avenue between the Department of Agriculture and Pennsylvania Avenue; these trees have never been pruned, and some of them are little more than straight

sticks, although it is something like fifteen years since they were set out. On the other hand, those trees planted on the west side of Lafayette Square and on Peirce Street are ideal specimens, owing to the fact that they have been shaped on several occasions.

The Silver Maple does not last in a healthy condition for more than sixteen years as a sidewalk-tree in Washington. As the natural soil is not of the best, when the holes are dug the soil taken out is carted away and new and better material takes its place. This keeps the tree in good health for several years, but when it gets beyond certain dimensions it, of course, begins to show signs of starvation in the losing of the lower branches and ripening great quantities of seed annually. The only way in which the life of the tree is prolonged for a few years is by cutting it severely in to the main stem. This is done in the early spring months, and before summer is over the tree is pretty well furnished with a profusion of fresh growths.

Botanic Garden, Washington, D. C.

G. W. O.

Notes from the Harvard Botanic Garden.

THE genus Urceolina, although a small one, has three interesting species. They are bulbous plants which belong to the Amaryllis family, and are found in the Andes. For the last two or three weeks some flowering plants of *U. pendula*, the drooping-urn flower, have been very much admired by visitors to the garden. These plants are scarce in gardens from some cause or other, and yet they are easy to grow and flower freely here every year. The bulbs measure about three inches across, and during the growing season they have one or two leaves. These are dark green, oblong, and contracted into the petioles and measure from ten to twelve inches in length and two or three inches at the broadest part. At the apex of an erect scape, which is about a foot and a half high, the pendulous flowers are produced in umbels, those on the plants here having from six to eight flowers, and the filiform peduncles are nearly two inches long. Just above the ovary the perianth is contracted and then enlarged into an oblong, tubular, urceolate throat, and the lobes are spreading at the apex. The showy part of the flower is the enlarged part of the perianth, which is nearly two-thirds of its length, and it is of a rich golden yellow color. The spreading lobes are green and margined with white. When the plants are in bloom they are without foliage, but the pots can be placed among groups of *Adiantum cuneatum*, where the flowers last for several weeks and make a pleasing show above the dark green fronds of the Ferns. After the plants have flowered they may be placed in an intermediate house and in a position where they will be kept dry. Just before growth begins in spring the bulbs should be taken out of the pots and the exhausted soil carefully removed. Then they may be replaced, one bulb in a five-inch pot, using clean pots, plenty of drainage and a light, porous, rich soil, with the top of the bulb level with the soil. After they are potted the plants are placed in the stove, where they are kept dry until growth begins, when they are supplied freely with water. When the leaves have done their work and begin to turn yellow in early autumn, water should be given sparingly and finally withheld altogether. The flower-scapes begin to push up a few weeks after the leaves disappear. This plant is interesting botanically, as it is one of the parents of *Urceocharis Clibrani*, a hybrid, the other parent being the well-known *Eucharis Amazonica*.

Piqueria trinervia is a very common plant in gardens, where it is known almost universally as *Stevia serrata*. It is a useful plant, as it comes into flower just after the Chrysanthemums, and its light airy branches, with their white flower-heads, are very serviceable for cutting, and they last well. The plants branch freely, and the stems, which are three feet high or more, are thickly clad with opposite, oblong lanceolate, dark green leaves, which are subserrate and have three prominent nerves. The white flower-heads are produced very freely, and are disposed in loose corymbose, many-headed panicles. There is a dwarf form of this plant which makes compact dwarf bushes about eighteen inches high. This dwarf form we find most useful here, as the plants are more decorative and make more compact specimens. When the plants have finished blossoming, which happens some time after Christmas, the old ones are discarded, except one or two, which are kept for stock-plants. Cuttings are struck in March, and after they are well-rooted they are put into small pots, where they are kept until time for planting out in the garden in May. They grow fast in the garden, and the young points of the branches should be picked out regularly, as it makes the plants bushy. About the end of August they are lifted and potted again.

They require careful handling in lifting, as the stems are very brittle and are apt to get broken. When cool weather sets in they are put in a cool greenhouse. This plant is figured in *The Botanical Magazine*, and has been cultivated as long ago as 1798, when it was introduced from Mexico. There is another form of this plant grown in gardens with white-edged leaves which is useful as a bedding-plant.

Botanic Garden, Harvard University.

R. Cameron.

The Eranthemums.

THE Eranthemums are remarkable for the beauty of their foliage and will probably prove valuable as bedding plants. In Europe they are considered quite tropical in nature, as some of them undoubtedly are, and in the damp English climate or in the colder countries of northern Europe they could probably not be used out-of-doors. But here, where the conditions are so different, where plants like the Acalyphas will do well in the open border, Eranthemums may be used with equal success. Their foliage is not as large as that of the Acalyphas, or as highly colored as that of Coleus, but they belong to a more refined type of plants, noble in outline, with soft, harmonious coloring.

The principal kinds coming under consideration as bedding plants are the strong, erect-growing forms that develop quickly and are as easily increased as Coleus. *Eranthemum albo-marginatum*, with long lanceolate-acuminate leaves of a grayish green color, mottled and margined with milky white, grows to a height of two or three feet. The leaves are opposite, eight or ten inches long, under greenhouse treatment. *E. nerium rubrum*, with rounded-ovate leaves of the same color as the preceding one, slightly whiter. *E. Eldorado*, with almost cordate leaves and an obtuse apex, green, reticulated with bright yellow. In *E. atropurpureum* the leaves are of a deep maroon color, or sometimes nearly black, of the same shape as those of *E. Eldorado*.

The soil best adapted to Eranthemums is a rich vegetable one. A bed of any ordinary garden soil, enriched with plenty of well-decayed horse-manure and some rotten leaves, would answer the purpose very well. The Eranthemums are generally grown in warm greenhouses in partial shade. As indoor plants, singly in pots, they are very ornamental, as well as easy of culture. Soft-wooded cuttings, when inserted in a slight bottom-heat, will root in three or four days. When used as house-plants, or by florists for decorative purposes, the plants should always be kept young and bushy, with luxuriant foliage as possible. As young plants are easily grown from cuttings old and stunted ones need not be kept.

Newark, N. J.

N. J. Rose.

Hybrid Perpetual Roses.

AFTER the Chrysanthemum season is past there is generally space in the greenhouses for other plants that have been stored in cold frames or other convenient places, and we now place the first lots of hybrid Roses in a warmth of forty-five to fifty degrees to start them into gentle root-action. There is not much gain by putting them in early. December is a good time if flowers are wanted in March, and it seems impossible to have good hybrids too early. We plant in deep boxes in preference to pots. The plants remain in the boxes during the whole year and there is no check to them at any time. The only time when the roots are disturbed is when the boxes decay. New soil should be added and a slight top-dressing given each spring after the plants are well started. This treatment, with liberal supplies of stimulants in a liquid form, will sustain the plants in vigor.

No hybrid Rose is so satisfactory for forcing as Ulrich Brunner for crimson. The noble foliage is not equaled by that of any other Rose, and it will stand the strain of early forcing for an indefinite period. We have plants that have been grown in this way for five successive years, and they are again in the greenhouse as good as ever. Gustave Piganeau, a newer kind, has proved weak, and it rarely makes strong enough growth to warrant its early forcing. The same may be said of Susanne Marie Rodocanachi, sent out to excel the Ulrich Brunner. Thus far it has failed to equal the older sort; the color is brighter and the foliage good, but it has also a somewhat weak constitution. Marchioness of Londonderry is a promising new early forcing variety; it is as near to white in color as hybrids come, there being just a tinge of flesh-pink in the centre of the blooms. The flowers are of the largest size, on stout stems, with foliage of the same texture and deep color as Ulrich Brunner, and it is also almost thornless. It seems to be one of the most meritorious of new Roses and belongs

to a class that is all too scarce, namely, hybrids of delicate tints approaching to white. Clio is another of this class, but growers say that it also is of a delicate constitution and not desirable for early flowering, but as it is grown by the English growers it would seem not to be delicate. Another season will, perhaps, decide the matter.

Mrs. R. G. Sharman Crawford is one of the newest Roses with a good reputation for forcing. It is also distinct from all others in color, a deep rosy pink, the outer petals shaded with pale flesh and merging into white at the base. It has been one of the sensational varieties of recent years, and will prove, it is hoped, good for indoor work. Captain Hayward is another sort not so well known as it deserves, a bright carmine-crimson of superb form and sweetly scented, and will make a good forcing Rose as far as can now be judged.

To those who cannot devote an entire house to early hybrid Roses during the whole year, there is an easy way to get good flowers quite as early and of equal perfection by planting in boxes at least six inches deep and of length to suit the benches, or long enough to plant four plants lengthwise and two deep. We get two crops of flowers by this method each spring indoors, and a considerable number of flowers during the summer and fall when the boxes are set out-of-doors to make their growth. They need comparatively little water; a sprinkling overhead with the hose serves to keep them both clean and moist, and in the fall the boxes are set on their sides to keep the plants from fall rains and to help mature the wood, which is at this time of a deep mahogany color with prominent buds for next season's bloom.

E. O. Orpet.

South Lancaster, Mass.

Propagating Chrysanthemums.—We have renewed our propagating-bed with clean gray sand, and intend in the course of a week to put in some cuttings of Chrysanthemums for specimen plants. This is about a month earlier than we have usually done this work, but, as the plants are intended for exhibition, they will need a longer season if they are to grow large enough to win a prize. Strong, short-jointed cuttings taken from as near the base of the stems as possible are the best. These should be cut into the soft growth and shorn of a few leaves, which would, if left on, hang about the base of the cutting and encourage damping. Abundance of water must be given for the first week, for the cuttings should never be allowed to wilt. They will be rooted in about thirty days, and may be potted into small pots in light soil and kept in a cool house.

Wellesley, Mass.

T. D. H.

Solanum capsicastrum—For the Christmas season no better decorative plant can be had than this old-fashioned and beautiful little subshrub. The numerous globular fruits, which are about half an inch in diameter and of a bright scarlet color, contrast well with the dark olive-green foliage. The plants, to be effective, should be dwarf and bushy, about as wide across as they are high and with well-set fruit. To grow them successfully, an airy and partially shady position must be had in summer. The watering should receive careful attention, and under no circumstances must the plants be allowed to get dry. At the same time the drainage must be good. Pinching of the young shoots is necessary to form bushy specimens, but as soon as the flowers appear in summer care must be taken not to pinch off flowering shoots. The flowers, and consequently the fruits, are produced in little clusters nearly opposite the leaves. The stem is slender and branching, with alternate, more or less lanceolate, leaves, generally appearing two together, one being much larger than the other. Altogether, this makes a most cheerful fruiting plant for Christmas table decoration.

Lælia anceps.—This beautiful Orchid, so rich in variety of color, is one of the very best for the Christmas season. The firmness and lasting quality of its flowers, their moderate size and delicate texture make this one of the most valuable of winter-flowering plants. The color ranges widely from pure white in the rarer and more expensive varieties to flesh-color, rosy purple, pale purple, rose and lilac, with more or less deeply colored crimson-purple, deep purple or maroon in the lip. The plants succeed well in cool and airy positions during summer, their growing season. They do well on blocks of wood or in baskets, the former mode being preferable, as the plants take no nutrient except from air and water. Well-diluted manure-water once a week is excellent for this as well as for most Lælias and Cattleyas. The large growers nowadays use very little fibrous peat and moss, if any at all, as it is not essential; it is rather an obstacle to the free development of the numerous long and fleshy aerial roots.

N. J. R.

Newark, N. J.

Correspondence.

Chrysanthemums.

To the Editor of GARDEN AND FOREST:

Sir,—Probably the majority of visitors to Chrysanthemum exhibitions in Boston would be as well pleased with smaller specimen plants than they have been accustomed to see, if they indicated equal cultural skill, but of late years the size of the plant has become such an important element in successful competition, that all growers for exhibition must make it a leading object.

Perhaps fashion in flowers has very much changed the Chrysanthemum during recent years, during even the last five. The Boston schedule five years ago called for all classes, and it was generally understood that there should be included representatives of all the types; and, as a matter of fact, the exhibitor who had the most diverse group, all things being equal, stood the best chance of winning. But size does not always go with this differentiation of the species, so that the neater Chinese, Anemone-flowered and Pompon varieties have been discarded in favor of the Japanese sorts.

I am disposed to think that we, the gardeners and florists, are making this fashion rather than the public; and that, if the Chrysanthemum is losing its popularity, as some say, we are to blame in a large measure. The criterion set up by the Chrysanthemum Society of America, of a stiff stem, with foliage up to the bloom, of decided colors, yellow, white, pink and crimson, without shadings, leaving out the purple and bronze colored varieties, forces raisers of new varieties who need their recognition, to discard many worthy kinds which would lend variety in color, so necessary in the proper blending of any color-scheme or combination. The demand of the professional florist for varieties of good shipping qualities has been another important consideration with the judges; and any loose-petaled varieties, no matter how attractive in form the flowers may be, seldom get more than "commendation." Very naturally, the florist will not grow these odd varieties, and discards them one after another as fast as it is discovered that they cannot be shipped to advantage. The retailer does not want them either, as he cannot handle them as profitably as he can the compact and mostly incurved flowers of the Japanese type, so common of late years. In looking over the catalogue of a leading firm in 1890, the only varieties of any standing among florists to-day are Minnie Wanamaker, W. H. Lincoln and Eda Prass, and these are holding their own for the simple reason that they can be shipped advantageously. The following comments I copy from Mr. A. H. Fewkes' report as chairman of the Flower Committee, in the *Transactions of the Massachusetts Horticultural Society for the Year 1894*. He says :

"The extremely large blooms are magnificent in their way, and show what can be done with the Chrysanthemum in skillful hands. We would not say one word against them, but in striving for immense size are we not losing many interesting forms which always attract attention when put on exhibition? It is true, these are not valuable commercially, but a Chrysanthemum show is not complete unless all the various forms are represented, and efforts should be made to grow as many forms as possible. Many curious varieties have come to this country from Japan which have been lost, simply because they were of no use as market flowers, or because they could not compete in the same class as the monster blooms. This should not be so, and we hope at no distant time we shall see more of the small but curious forms at our exhibitions."

In moving among private gardeners and amateurs we know that they would prefer to see more of the artistically and curiously formed flowers grown than we have, and when a dozen or more are arranged in a vase a variety of color and shading, when handled with proper skill, produces the best effect, and when it is possible to mix in a few smaller blooms with the larger ones a still better effect can be made. Among the varieties which florists every year discard may be found such as Spaulding's Heron's Plume, a lovely variety with shining strap-shaped petals of the purest white, and twisted like a ball of ribbon; Gloriana is a yellow variety of similar make; Iora, a finely built flower of tubular, twisted and interlaced petals, of a lovely lavender-pink, a color found in no other variety. In carrying a large plant of this variety over seventeen miles of road into the Boston exhibition we had to make a separate parcel of every bloom, snugly twisting it up in tissue-paper, or all the blooms would have so interlaced that they never could have been separated without destroying the beauty of the plant. There is Tuxedo, of brilliant orange-red, no other known variety equaling it in depth of color, but the flowers are undersized; that is enough to consign it to oblivion.

One of the most pleasing features of the last Boston show was a group of Japanese Anemone-flowered sorts, shown by Mr. Brydon, gardener to John Simpkins, Esq., of Yarmouthport. It is safe to say that these attracted more attention than the largest blooms exhibited. Dr. G. C. Weld (Kenneth Findlayson, gardener) also showed a striking lot, including Gaza, a beautiful white; Yellowhammer and Judge Hoit. Mr. Simpkins' group contained some immense blooms, Rider Haggard being especially noteworthy on account of size, but these large ones were not as beautiful as several smaller forms, among which may be mentioned George Hawkins, yellow; Ida Strickland, bronzy; Enterprise, light pink; Mrs. F. G. Dexter, crimson and yellow; Mrs. Robert Owens, white; San Joaquin, large pure white, and Satisfaction, chrome-yellow, with notched and twisted petals, an elegant flower. Mr. Howard, of Winter Hill, Somerville, had a neat lot of Pompons in one corner of the hall, and there never was a time when one could not see three or four elderly persons, usually ladies, admiring them and talking of bygone days in the old garden at home.

Wellesley, Mass.

T. D. Hatfield.

Viburnum Lantana.

To the Editor of GARDEN AND FOREST:

Sir,—Viburnum Lantana well deserves the commendation which you give it. When in England, last summer, I saw quantities of it growing wild, and most beautiful it was. It was invariably growing on the top of chalk cliffs, as I found it where chalk was close to the surface. Near Brading, in the Isle of Wight, there are great elevations, like small mountains, called downs, which are composed almost wholly of chalk, and on the summit of these, sometimes with not six inches of soil above the chalk, this Viburnum grows in quantities and in most vigorous condition. It was in July when I saw them, and the bushes, which were from six to eight feet high, were loaded with fruit, which was just turning from green to red. In the hedgerows adjacent, and elsewhere in the island, were many bushes which had sprung up from seeds dropped by birds. About the same time of the year, at Henley-on-Thames, I saw the shrub in thickets, and here, too, chalk was abundant.

As I write, in the middle of December, there are small seedling plants in Germantown with their leaves still alive, though severe frosts have occurred; but small seedlings of many species retain their foliage later than larger plants do.

Germantown, Pa.

Joseph Meehan.

Irrigation in New Jersey.

To the Editor of GARDEN AND FOREST:

Sir,—The note in GARDEN AND FOREST, December 11th, page 496, under Cultural Department, giving Mr. Hale's method for irrigation, leads me to send a few words concerning irrigation as carried out during the past season at the College Farm.

The water used is from the reservoir which supplies the city of New Brunswick. The field upon which the water was applied has a slight incline, and the water was carried to its upper side by means of underground pipes which end—three of them—in uprights provided with faucets and surface iron pipes. To the faucets inch garden-hose was attached, and the water thereby applied to the surface of the ground.

The piping was not in place until past midsummer, and was not employed until the dry spell of autumn.

A crop of Wax Beans was planted in August, and to a portion of the area thus occupied water was applied between the rows. Upon one one-hundred-and-twentieth of an acre 1,685 gallons were applied during a period of three weeks, from September 17th to October 5th, when the beans were harvested. The average yield of the non-irrigated belts, in good-sized pods, was seventeen pounds, while upon the irrigated land it was forty-five pounds, or nearly three times as many; besides, the pods were larger-sized and of finer color and quality.

To another area of the same size 1,830 gallons of water was applied to Peppers. The average yield upon the non-irrigated belts was 717 fruits, but upon the irrigated land it was 1,277. In weight the difference was greater, for the non-irrigated land gave 80 pounds, while where water was applied the weight was 147 pounds. The latter fruit was much better in color and quality, and would sell at the highest price.

A crop of Celery was grown after Beans, the plants being set August 6th. The rows were four feet apart, and each alternate row received water from September 17th until October 28th. The total weight of celery produced was 465½ pounds, 329½ pounds being in the irrigated rows and 136 pounds in the rows

receiving no water. In round numbers, this is two and a half times as much celery upon the irrigated as the non-irrigated land. These figures do not indicate the full difference of market value. The largest yield for both the irrigated and non-irrigated belts was upon one of the two to which the Bordeaux mixture had been applied, and this was therefore selected to determine the relative amounts of refuse. After the plants were prepared for market, by removing worthless outside leaves and the roots, the weight of the irrigated plants was reduced from forty-two to thirty pounds, while that of the non-irrigated rows fell from 17 to 10½ pounds. In short, the difference in marketable products of the two rows is as three to one, but when the actual selling price is considered it is not far from eight to one in favor of irrigation.

The method of applying the water, the dates and amounts for each crop, the cash and other details of this irrigation experiment with garden crops will soon appear in a bulletin from the New Jersey Experiment Station.

New Brunswick, N. J.

Byron D. Halsted.

Meetings of Societies.

Irrigation for Kansas Farms and Orchards.

THE twenty-ninth annual meeting of the Kansas State Horticultural Society was held at Lawrence, the centre of a large fruit-growing interest in the eastern part of the state and the seat of the Kansas University. The subject of greatest interest to a largely attended assembly was irrigation as applied to fruit-growing, with the allied subject of subsoiling. Perhaps the most interesting paper on the programme was by George M. Munger, of Eureka, Greenwood County, on Irrigation with Storm Waters. Mr. Munger owns the largest farm irrigated in this way in Kansas, if not in the United States. His orchard comprises over five hundred acres, principally Apple and Pear trees, besides two hundred acres of forest-trees and other land not in orchards. His reservoir now covers sixty acres, but is designed to cover eventually a hundred acres, the water in the deepest part being now seventeen feet. The dam which holds this water is made across the mouth of a broad, shallow valley, and is constructed entirely of earth. It is ten feet broad at the top, so that teams can be driven over it in making repairs. In building the dam the surface soil was first removed and the subsoil, which is a stiff clay, was used in its construction. It was put on in thin layers, say a foot in thickness, so that it was thoroughly tramped by the teams. The surface soil was used on the faces of the dam. Two drains, or ditches, filled with broken rock, were put in the bottom of the dam, running lengthwise of it, to carry off the seepage water. This Mr. Munger considers very important in preventing the dam from becoming soft and thus allowing the formation of leaks. The spill-way must not be through or over the dam, which must be built so high that the spill-way can be carried over the original surface, around one end of the dam. This is an important point, in Mr. Munger's opinion, when heavy rains come, especially when, as is apt to be the case, the water-shed drained is too large for the reservoir. The water from Mr. Munger's lake is pumped by a steam-engine and a centrifugal pump to a reservoir on the highest point of the farm, from which it is distributed by ditches. Situated, as the plant is, in the eastern third of the state, the experiment will be watched with interest by all who believe, as many now do, that in any part of our state, and, indeed, of most other states, there will be periods of drought in almost any season when it will pay to apply water to crops.

In speaking on orcharding in western Kansas, Mr. Longstreth, of Lakin, Kearney County, which is in the extreme western part of the state, brought out a point which is of interest in connection with Professor Waugh's article in a recent number of GARDEN AND FOREST on the "Western Apple Crop." Mr. Longstreth has an orchard of seventy acres, set in 1886, principally Apple-trees. Since the orchard came into bearing he has had but one failure, and that was from the effects of a late frost. During the past season, when apples were falling so badly all over the state, he has had no trouble whatever in that way. In fact, he never raised a larger crop of finer apples. He irrigates twice a year—once in February and once in July—flooding the land, and using about ten inches of water each time. He finds that watering heavily a few times gives better results than more frequent and less copious watering.

Professor Haworth, geologist at the Kansas University, gave an interesting account of some researches made last summer in regard to the underflow, so-called, in the western part of the state. He found that water-bearing strata underlie most of

the western third of the state at a depth varying from a few feet to a hundred or more, and the supply seems inexhaustible. Mr. Cowgill, editor of *The Kansas Farmer*, gave the results obtained on his farm in this region, which seem to confirm this opinion. He has in his well a six-inch cylinder pump. To this was attached a gasoline engine, which was run for five hours, pumping at the rate of 500 gallons a minute. This apparently having no effect, the speed was increased so as to throw 700 gallons a minute, and the pump was run for seven hours, when the water in the well was lowered just two inches.

Mr. Evans, President of the Missouri Valley Horticultural Society, described a cold-storage plant on the grounds of the Alden Fruit Company, in southern Missouri. The building is eleven feet high, twenty feet wide and a hundred and fifty feet long. There is a driveway through the middle, and the apples are stored on each side. The building is set north and south on the natural level of the ground, the sides being double and filled with sawdust, with earth banked up nearly to the top of the walls outside. They depend entirely on lowering the temperature of the house during cool nights. At each end of the building is an air-tight anteroom with doors opening both into the building and outside. There is also a heavy grating, which may be closed and the doors left open. Whenever the outside atmosphere is lower in temperature than that in the house the doors are opened, and if at night, as, of course, is usually the case, the grating is closed to keep out intruders. In this way the temperature of the house was gradually forced down to forty degrees, Fahrenheit, quite early in the fall, and the apples, stored as gathered, are now in as fine condition as they were when picked. In storing the apples the teams are driven into the air-tight anteroom before mentioned, and the outer door closed. The inner door is then opened and the team driven into the storeroom, thus preventing almost entire draughts from the outside when they would raise the temperature of the house.

In a paper on some of Munson's Hybrid Grapes, Professor S. C. Mason characterized Brilliant, a cross between Lindley and Delaware, as one of the finest red grapes ever offered. It is more attractive in color and more sprightly in flavor than either of its parents. It is a free, vigorous grower, but at the experimental vineyard needs winter protection. Munson's hybrids, with the Post Oak Grape, *Vitis Lincecumii*, are entirely different from all the other classes at the station. They are late in blooming, coming into flower as other sorts go out, and frequently remaining in bloom till the middle of June. This is a valuable characteristic when late frosts are likely to occur. All these Post Oak hybrids have proved tender. This may not be due entirely to cold, however, but to some other cause or combination of causes. These hybrids are probably better suited to southern Kansas and Oklahoma than to the latitude of Manhattan. Carman is one of the best, being about the size of Ives, with handsome compact bunches and a fine purple bloom. It is of fair flavor, but has rather too many seeds for a first-class table grape.

State Agricultural College, Kansas.

F. C. Sears.

Recent Publications.

The *Annual Report of the Director of the Experimental Farms of Canada for 1894*, an octavo volume of 422 pages, has just been issued, and proves to be a volume of unusual practical value and interest to the farmer and fruit-grower. Omitting all reference to the purely agricultural features of the report, it is found to be especially suggestive to the horticulturist and the forest-tree planter, Director Saunders himself being an enthusiastic tree-planter. He has planted forty-six trial hedges at the Central Farm at Ottawa for comparative study, including not only hedge-plants as ordinarily understood, but such trees as White Elm, Spruce, White Pine and Hackberry. Of these thirty were planted in 1889-91, among which the Siberian Pea-tree (*Caragana arborescens*), Russian Mulberry, White Spruce, Barberry, Golden-leaved Spiraea, Arbor-vitæ, Lilac, Viburnum (*V. lantana*), Buckthorn (*Rhamnus frangula*) and Colorado Blue Spruce are especially liked for one purpose or another. A list of flowering shrubs desirable for Canada, with description of each, is added. Of several varieties of Russian Poplars and Willows named, *Populus certinensis* is especially recommended, although it is noted as only half-hardy at Brandon and has failed utterly in the plantations of the South Dakota Experiment Station.

As a result of spraying experiments continued over a period of six years, during which thirty different mixtures were tested, Professor Craig, the horticulturist, recommends an application of solution of bluestone before the foliage appears, followed by Bordeaux mixture of a strength of four per cent. copper sulphate, four per cent. lime and fifty gallons water. If the disease is not overcome before the fruit begins to color, the ammoniacal solution of carbonate of copper, which is colorless, should be used as a last application. Detailed statements of experiments in commercial orchards are given and fully justify the recommended practice.

Regarding Russian Apples, many varieties of which have been planted at the Central Station, Professor Craig says, "With present experience, I can now say that I do not know of any winter Russian Apples which seem to me worthy of cultivation where Ontario and Northern Spy can be grown successfully."

In 1893 twenty-nine varieties of Russian Apples were planted at the Brandon, Manitoba, Station, and only ten of these survived the first winter, all the survivors being in a badly damaged condition. Anis Apples, planted in 1890, have only been able to survive on account of the snow-drifts which have covered them entirely every winter, and they are making no progress. Native Plums, taken from the Brandon Hills, and seedlings of Weaver, Cheney, Speer and De Soto, which were planted in 1890 to 1893, seem thus far promising, the natives having borne a good crop of fruit in 1894. Neither the standard or the Russian Cherries have succeeded at this station, but the wild Sand Cherry, *Prunus pumila*, is doing well.

Mr. Bedford's notes on the forest-trees growing at the Brandon Station form much the most interesting part of his report. In a shelter-belt ninety-five feet wide and 775 feet long, the trees were planted 4½ feet by 4½ feet in 1889. Blanks were reset in 1890 and 1891. From a tabulated statement it appears that the highest trees are Dakota Cottonwood and a Russian Poplar, *P. Bereolensis*, each sixteen feet. Among the best growths are Canoe Birch, twelve feet; Sweet Birch, *Betula lenta*, thirteen feet; Box-Elder, fourteen feet; Carolina Poplar, fifteen feet; Sharp-leaved Willow, *Salix acutifolia*, fifteen feet; Aspen, ten feet; several Russian Poplars, twelve to fifteen feet; Manitoba Larch, eight feet; native White Spruce, six feet; native Green Ash, nine feet. Among other hardy subjects reported are Bur Oak, Red and Black Ash, European Larch and native White Elm, while of smaller trees, the Manitoba Mountain Ash, Laurel-leaved Willow, *Caragana arborescens* and *Artemisia Abrotanum* are hardy.

Mr. A. Mackay, the Superintendent of the Experimental Farm at Indian Head, Northwest Territories, reports a general failure of orchard and small fruits, and in the report on forest-trees the list of promising kinds is limited. Box-Elder has been most extensively planted and is favored. Among other native species that are doing well are the Buffalo Berry, Choke Cherry, Wild Red Cherry and Saskatoon, *Amelanchier alnifolia*. Several of the Russian Poplars and Willows are considered good, and the Russian *Artemisia* is most highly recommended as a low wind-break for cultivated fields and gardens.

Notes.

The Oregon Experiment Station is making a horticultural survey of that state by sending out circulars of inquiry to every section, so as to ascertain all the facts which will be of interest to persons who wish to engage in fruit-culture or gardening of any kind. A similar survey has been made by the chemical department, in which the character of the soil is approximately described.

Professor Massey inquires why the dealers in Christmas greens do not send to the North Carolina coast country for branches of the beautiful Yaupon or Cassena, *Ilex (Cassine) Vomitoria*, whose berries are more abundant and brighter than those of our common Holly, and whose foliage, although not

as glossy as that of the English Holly, is smooth, rich green and very attractive.

A seedling Apple from north-western Arkansas, which attracted some attention at the World's Fair, is highly praised by the fruit-growers of that state. It is called the Senator, and Mr. Carman, of *The Rural New-Yorker*, to whom one of the fruits has been sent, describes it as a red apple on a greenish yellow ground and sprinkled with grayish dots. The flesh is yellowish white, stained with pink, of a sprightly and intense apple flavor, agreeably blending the acid and the sweet. It is said to be about a month later than the Jonathan apple—that is, it should be picked about the first of October in north-western Arkansas. A new apple of good size, good color and very good quality is worth trying in other sections of the country.

A recent number of *The Garden* contains an illustration of the fruit of *Physalis Franchetti*, a new Japanese Winter Cherry. P. Alkekengi is well known for its cherry-like fruit inclosed within the balloon-shaped calyx; the fruit of this new variety is similar in structure, as large as a duck's egg, and is said to be a charming shade of red or orange-vermilion. These inflated calyces, being translucent, have the appearance, when set in the light, of diminutive Japanese lanterns hanging among their own soft green leaves. The variety was introduced from Japan a year or so ago by Mr. J. Veitch, of Chelsea, London, and fruited luxuriantly this autumn on his trial grounds. Like the old-fashioned Winter Cherry, it has some value in cookery, but it is chiefly for ornament that it will be valued in our gardens and for autumnal and winter decoration.

Dr. D. Morris, Assistant Director of the Royal Gardens at Kew, sailed from this port on Thursday for the Bahama Islands, where he is to investigate the plantations of Sisal Hemp and other industries in the British West Indies. While in this city Dr. Morris delivered a lecture under the auspices of the New York Botanical Garden in the hall of the Museum of Natural History. This lecture was a sketch of the great botanical establishment with which he is connected, giving an account of its different departments, a description of its museums and galleries and a sketch of its general administration, and more particularly of the influence of Kew upon scientific botany and the development of horticultural industries in the colonies. The discourse was illustrated by excellent lantern views, and gave much pleasure and instruction to a large audience.

The Agricultural Gazette, of New South Wales, states that there is still living at Kenmore, in excellent health, Mr. Charles Ledger, the man who forty years ago, after most perilous adventures, introduced the variety of Cinchona Calisaya known as Ledgeriana into the island of Java, and not much afterward introduced a flock of alpacas and other animals from South America into Australia, which have been of priceless value to that country. Messrs. Howard & Sons, the great quinine firm, says that the supply of Peruvian bark from Java is almost all from the Ledgeriana trees, the only complaint against this variety being that it has turned out so rich that the trees are supplying too much quinine for the world to consume. Perhaps the quantity of bark which is now produced every year from seed furnished by Mr. Ledger cannot be short of ten million pounds, and to him, more than any one else, perhaps, is due the fact that quinine has been brought within the means of the very poorest.

The cabbage maggot, which is the larva of *Anthomyia Brassicæ*, is a destructive pest of the Cabbage in Europe, where it sometimes destroys entire fields of young plants. But, although it has been occasionally noticed in this country for the past fifty years, it has rarely appeared in such alarming numbers as it has during the present year on some of the truck-farms of North Carolina. If the maggots appear in the seed-bed a dressing of lime or muriate of potash should be given to the soil, or else enough of the kerosene emulsion to wet the ground one inch deep. If plants in the field are attacked a hole should be made near each plant with a sharp stick about an inch in diameter and as deep as the roots of the plant, and filled with the kerosene emulsion. If this does not moisten the soil on all sides of the plant a similar hole on the opposite side should be filled. The emulsion should be made of half a pound of hard soap, one gallon of water, and one gallon of kerosene oil, diluted with nine times its bulk of cold water before using. When properly made this emulsion does not hurt the plants, but if any of the free oil rises to the top it should not be allowed to touch the leaves.

Thomas Andrew Knight, of whom a brief account is given in another column, was among the first to realize that the garden Pea could be improved by cross-fertilization, and as long ago as 1787 he crossed the flowers of one of the common white peas then in cultivation with the pollen of a gray pea, and was so pleased with the results that a few years later he introduced Knight's Tall Green Marrow and Knight's Dwarf Green Marrow, perhaps the earliest examples of improved seedlings, which now are numbered by hundreds. This was the beginning of the advance toward the wrinkled section, the different varieties of which are now almost exclusively planted for home use. In a lecture on the garden Pea and its varieties by Mr. A. J. Deal, and reported in *The Journal of Horticulture*, it is said that in England the *Ne Plus Ultra* is looked upon as the best-flavored pea, although some of the sorts with dark green pods, like the Duke of Albany, Autocrat and Sutton's Late Queen, surpass it in this respect. The Pea most grown for the London market is Telegraph. Very probably the tall Peas, that is, those exceeding three or four feet high, will be banished, as well as the round-seeded kinds.

It seems to be settled that underground irrigation is practicable in western Kansas, where the water is pumped from the so-called underflow. Of course, the method is not practicable in open soil and a porous subsoil, for the water will not spread laterally in a soil lacking capillarity, nor will it rise to the surface, but will run away and be lost. But in a soil of fine texture, containing silt or clay mixed with fine sand, the water will spread in every direction, and when applied through tiles fifteen or twenty inches below the surface all the water is utilized. In the hot summer months much water is lost when applied in ditches; at least an inch of water will evaporate from freshly moistened soil in less than three days. When the water enters the ground below the surface no crust is formed and there is no need to cultivate after each application, for the surface keeps dry and acts as a mulch. Another advantage of this system is that pumping can be kept up all winter, and wind power can be used during the months when the most wind prevails. According to *The Kansas Farmer*, subirrigation has been tried, not only for vegetables, but to some extent for field crops and for orchards, although for the latter purpose it has failed in California, from the fact that the roots of the trees ultimately filled the tiles and stopped the waterflow. In Kansas tiles are laid closely in level ditches and cement is poured over the joints, leaving but a small aperture at the bottom, and it is hoped that the tree-roots can be kept out. Experience alone will tell. Certainly it seems that subirrigation would be a good method for the disposal of sewage in country places, and in this way help to get rid of the expensive and dangerous cesspool. The waste-pipe from the house could be connected with a system of tiling in the vegetable garden or elsewhere; water and fertilizing material could thus be put where they are needed and the cesspool could be done away with.

It is well known that Cannas were rarely planted except in botanical gardens twenty-five years ago, when Monsieur Année, of Passy, France, began to obtain crosses between the different species. After that time great advance was made until the race of large-flowered plants was obtained by Monsieur Crozy. In the last number of *The Gardeners' Chronicle* Mr. Edouard André speaks of still another race, which he calls Italian Cannas, produced by Messrs. Dammann & Co. at their grounds, near Naples. Monsieur Sprenger, a member of this firm, concluded that by constantly interbreeding the large-flowered varieties nothing novel or more remarkable could be secured, and he, therefore, has been experimenting with some new blood, employing for this purpose the Canna flaccida, a species of the southern United States, of medium height and large flowers, with one specially developed petal. His first success was a plant named Italia, from seed of Madame Crozy, fertilized with a fine variety of C. flaccida. The flower is of unusual size, of a golden vermillion color, and the peculiarity of it is that it is flattened so as to resemble a Kampfer's Iris or a Cattleya. Another variety, Austria, was produced the same year, bearing yellow flowers, shaded with purple. In 1894, Atalanta, America, Burgundia and Allemania, all plants distinct in foliage and flower, were selected from thousands of seedlings, and a dozen named varieties of new forms and colors have been produced this year. The illustration of a single flower of Italia shows that it is very interesting in form and about five and three-quarter inches across. American hybridizers have been producing some fine Cannas, and they will not be slow to avail themselves of this new departure and make experiments in the same direction.





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